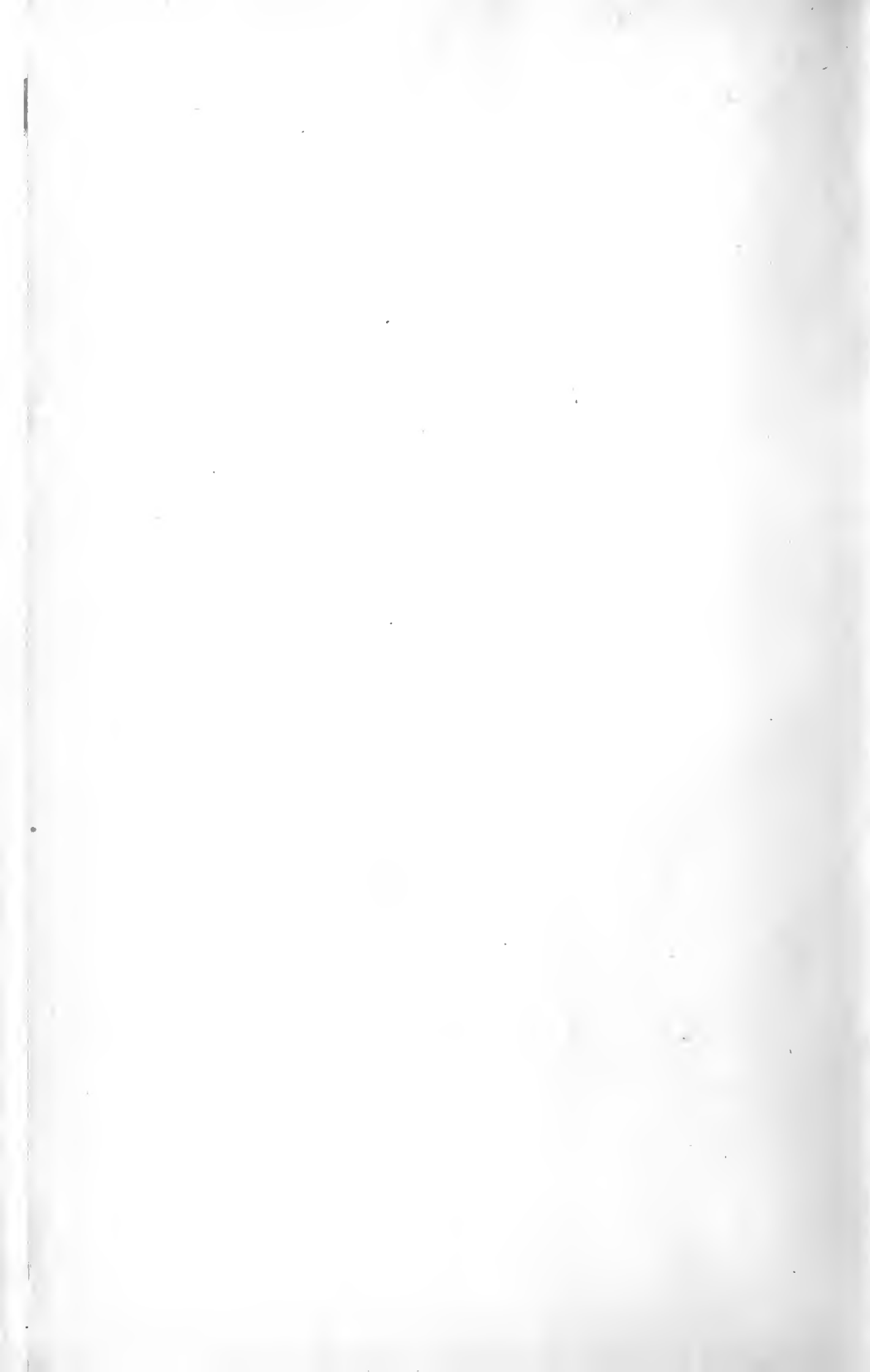




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Course of Study *for the* High Schools of Kansas.

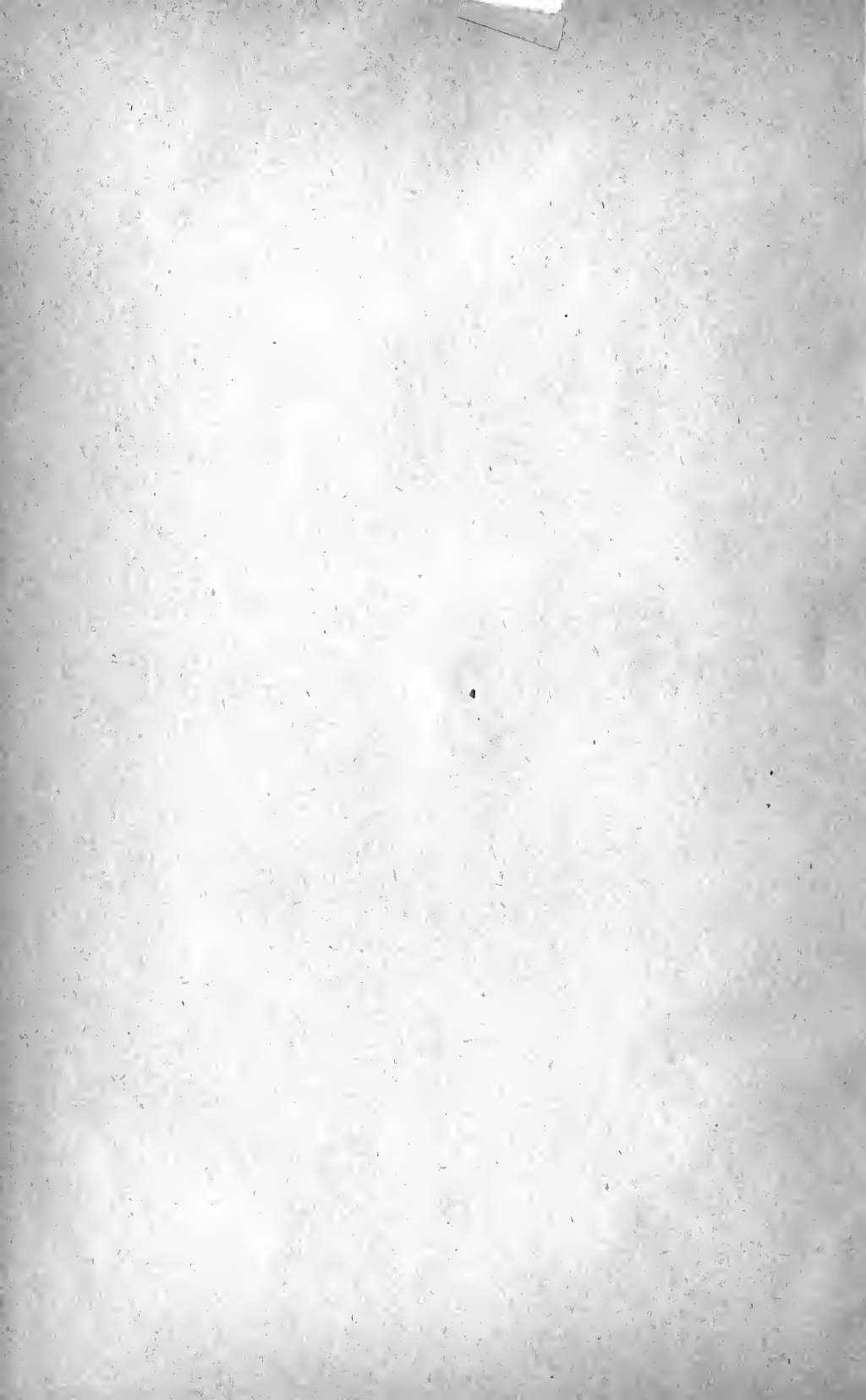
Prepared by
The State Board of Education.
1912.



STATE PRINTING OFFICE,
TOPEKA, 1912.

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Sec. 1, Art. 5, 1902

COURSE OF STUDY FOR HIGH SCHOOLS.

Section 1 of chapter 387, Session Laws of 1905, reads in part as follows:

"The State Board of Education shall prescribe the course of study for the normal institutes, and for the public schools of the state, and shall revise the same when the interests of the schools require it."

Acting under authority of this law, the State Board of Education in 1908 prepared for the high schools of the state a course of study, which has been generally accepted as the standard course of study for high schools and which has done much to unify the work of these schools. The legislature of 1911 made the responsibility of the State Board more definite by requiring as a condition for admission to the freshman class of an accredited college or university a four-year high-school course, or its equivalent, approved by the State Board of Education. The same legislature enacted a law providing that after May 1, 1913, county teachers' certificates shall be issued only to those who have completed at least one year in an accredited high school; and after May 1, 1917, certificates shall be granted only to those who have completed four years of high school work or its equivalent. These legislative enactments, together with the normal-training high-school act, which has been applied to 160 high schools and academies, emphasizes the responsibility which rests upon the State Board of Education with reference to the high schools of the state.

Within the past ten years the number of high schools and the number of students enrolled have increased 100 per cent, and this remarkable growth has not been confined to the cities, but has extended to many of the smaller towns; and the time seems to be rapidly approaching when free high-school privileges will be available to every eligible boy and girl in Kansas.

In view of these facts and considerations, the State Board of Education recognizes the importance of providing for the high schools a course of study which may represent, as far as pos-

sible, the most approved modern thought concerning secondary education, and in revising the high-school manual an attempt has been made to prepare a course of study sufficiently elastic to meet the individual needs of the throng of young people who are crowding into our high schools.

In preparing this manual the Board has had in mind the needs of those boys and girls who have in anticipation a course in some institution of advanced grade, and of those, also, whose formal education will be limited to the high-school years, and who in those years must make all possible preparation for successful accomplishment in the various fields of practical endeavor. Accordingly it will be observed that those subjects which are connected with vocational training have a place along with the branches which have long been associated with the traditional high-school course.

In this enriched curriculum it is not to be understood that every student will be able to avail himself of all the advantages offered. On the contrary, a wise selection must be made by each student, or by those who are his advisors, of those features which seem to promise the most satisfactory results in each individual instance.

The incidental opportunities for culture in a four years' membership in a well-organized and well-administered school, under the instruction of live, enthusiastic teachers, are of unmeasured value; and in this membership in the citizenship of the school are found many of the elements and conditions which belong to the larger citizenship in the state, for which the high school should be in a large sense preparatory. To make this preparation more positive in its character, a definite course of instruction is recommended in the duties and privileges of citizenship. This is placed in the first year of the course, in order that it may be pursued by those whose membership in the school may be limited to the brief period of one year.

A course in elementary general science is also recommended for the first year, as an important mental furnishing for those who may not have the opportunity of more extensive study in scientific branches.

It is strongly urged that all high schools base their course of study on the general course presented in the following pages, and that a sufficient number of electives be offered in each term to accommodate students of varying tastes and capabilities.

Whether one, two, three, or four years of work should be offered should depend entirely upon the teaching force of the school and the equipment provided. In our judgment, not more than three years of high-school work should be attempted if there are not more than two teachers to do the work.

We trust that this labor of the State Board of Education will be of real service to the high schools of Kansas, and that the results will meet the approval of school boards, superintendents, principals, and teachers.

THE PLACE AND FUNCTION OF THE HIGH SCHOOL IN THE PUBLIC SCHOOL SYSTEM OF THE STATE.

The importance of the place which the high school occupies in the public school system is indicated by the constant increase in the number of high schools organized and maintained, by the character of the buildings and equipment provided, by the variety of the facilities offered, by the extent of the courses of study, by the ability and enthusiasm of the teachers employed, by the generous sums appropriated for buildings, equipment, and maintenance, and particularly by the steady increase in the number of boys and girls who are making use of the opportunities which the high school offers.

ENROLLMENT.

The number of pupils enrolled in the high schools of Kansas in 1911 was 31,763. This is an increase of more than 200 per cent in ten years and an increase of more than 100 per cent in the last five years. The number of high schools in the state in 1910, as reported by the state superintendent of public instruction was 468, of which 247 maintain four-year courses of study. In ten years there has been a gain of over 200 per cent in the number of high schools, and in the last five years there has been a gain of over 100 per cent. The number of teachers in high schools has increased faster than the number of pupils, the gain being 120 per cent in the last five years, which shows that there has been a record not only of numerical increase, but of improvement in the quality of the service.

DEVELOPMENT.

The following significant statement is quoted from the Seventeenth Biennial Report of the state superintendent:

"The progress and development of the high schools are phenomenal. There is a constant increase in the number of accredited schools of this character, and the teaching force is, with rare exceptions, composed of college or normal-school graduates. The increased enrollment and the ever-growing number of graduates testifies to the definite progress being made and is conclusive evidence of the faith of the public in the high school. A most interesting feature of this work is the growing recognition on the part of authorities that the high school, in addition to offering preparatory courses for college, must at the same time extend more varied courses to that great body of pupils whose formal training concludes with the high school. The number of such schools introducing manual training, domestic science, agriculture, business courses and general courses is constantly increasing, and it would appear that the day is not far distant when all of the pupils of our high schools may find work best suited to their individual needs."

In accordance with the act of the legislature of 1909 providing for normal training in high schools, 160 schools, representing 90 counties, have been approved as normal-training high schools by the State Board of Education. Of these 136 receive the state appropriation of \$500 annually. Under the industrial training act of 1911, agriculture and domestic science are taught in 98 of the high schools approved for nor-

mal training, and receive an additional appropriation of \$250 from the state. All of the high schools which receive state funds are subject to inspection by a representative of the State Board of Education, under the direction of the state superintendent; and in respect to buildings, equipment, course of study, and qualifications of teachers, they are subject to approval by the State Department of Education.

MODIFICATIONS TO MEET GROWING NEEDS.

During recent years no department of public education has received more earnest consideration on the part of administrative officers, students of educational progress, or the public generally than the public high school. The value of high-school education, both as a necessary preparation for admission to college or university, and as an effective practical training for the successful pursuit of the various life vocations, is generally recognized; and many intelligent proposals have been made and adopted to secure modification of the course of study so that the two objects, preparation for advanced scholarship and preparation for a vocation, may be secured with the same degree of efficiency. As the number of students increases, and as the desirability of providing for each student the sort of instruction which is best adapted to his individual needs is recognized more clearly, the demands made by the community on the high schools become more varied and more exacting. Fortunately the resources of the schools are increasing both in respect to financial support and in the available supply of teachers of versatile talents, so that the high school has in a remarkable way kept pace with the growing needs of the various communities. It is exceedingly desirable that this development should continue in progressive ways, so that the people may receive a full measure of benefit in return for the expenditure of money and effort which the high school costs.

THE FUNCTION OF HIGH-SCHOOL EDUCATION.

The Kansas State Board of Education gives its official approval to the following propositions, the substance of which was set forth in a special report on "Articulation of High School and College" adopted by the secondary department of the National Education Association, at San Francisco, in 1911. (This report is worthy of careful consideration by superintendents, principals and high-school teachers. Copies may be obtained from Clarence D. Kingsley, Chairman, Manual Training High School, Brooklyn, N. Y.)

1. *The enriched curriculum.* The high school must continue to enrich its curriculum by the addition of subjects which are of practical vocational value, and must also retain the traditional subjects whose cultural value has been approved by experience. It is not proper, however, to require or permit any one student to undertake the study of too great a variety of branches at one time. Thoroughness in a few things is better training in preparation for any career than a superficial study of subjects in such variety that nothing can be well done.

2. *Aims.* General intelligence, health and vigor of body, the power of initiative, and social efficiency are among the results which the high-school instruction should be designed to secure, and this may properly be required by the community which supports the school.

3. *Adaptation to individual needs.* An opportunity should be given to each student in the high school to test his adaptability to different kinds of work, and the studies of the boy and girl should not be so arranged as to make it necessary for them to decide unalterably upon a future career at the beginning of the high-school course, before tastes and talents are discovered. On the contrary, there should be ample opportunity for readjustment of individual plans as the pupil grows to maturity of judgment and in the knowledge of his capacity and limitations. Thus the high-school student on graduation should be able to

make a wise choice of his vocation, and no decision made in the early years of his course should be such as to prevent him from entering without serious inconvenience or difficulty either upon a course of higher education or upon the work of his life occupation.

4. *Training for efficiency.* The high-school training should be such as to develop efficiency, and therefore the exercise of individual gifts and the expression of dominant interests should be encouraged rather than repressed. The liberal and vocational elements in education should be blended, so that the boy and girl may be trained for individual usefulness, and so that they may see the relation between their own work and that of others.

5. *Vocational elements.* Mechanic arts, agriculture, and household science should be recognized as rational elements in the education of all boys and girls, and especially of those who have not yet chosen their vocation; and the industries of the local community may well be represented among the branches of instruction. A course of study should be approved which will help to prepare boys for efficient industrial accomplishment, and which will develop in the girls capacity for and interest in the proper management of a home, thus having relation to the needs and responsibilities of the future men and women.

THE PREPARATION OF TEACHERS.

The high school occupies a position of such acknowledged importance and dignity that the necessity for the employment of thoroughly qualified and eminently skillful teachers is evident. Only those should be appointed to this responsible work who have an inspiring and sympathetic personality, whose scholastic preparation is adequate, and who possess in a marked degree the gift of teaching. Evidence of thorough scholarship should be required, including a satisfactory record as a graduate from a four-year course of university or college, or from an equivalent course in a standard normal or technical school. This academic training should include the content and pedagogy of the subject which it is proposed to teach, and should be supplemented by the general work in education which is required by the State Board of Education in the accredited colleges. In addition to this, an apprenticeship should be served in some position where there is opportunity for expert direction and criticism.

Course of Study.

The course of study proposed for the high schools of Kansas, as outlined in this manual, is based upon the foregoing considerations.

AMOUNT OF REQUIRED WORK AND UNIT VALUE.

The amount of work to be required for graduation from a standard four-year course is represented by fifteen units. A unit is understood to mean the study of any branch requiring preparation outside of the recitation, for a full school year of at least thirty-six weeks, with five recitations a week, each recitation period being at least forty minutes in duration. In the case of scientific branches which require laboratory practice, there should be no less than three recitation periods and the equivalent of two double periods of laboratory practice each week. In vocational branches and other subjects which do not require study by the student in preparation for the recitation, a unit of credit should be given for a course of daily exercises with double, or eighty-minute periods extending through an academic year, and a half unit of credit for a course with forty-minute periods extending through a year.

Fifteen units is considered preferable to a greater amount of required work for the following reasons, which are offered by the report of the committee of the National Educational Association referred to above:

- (1) Quantity should be subordinated to quality.
- (2) There will be less likelihood of injurious overstrain.
- (3) In case of possible failure in one unit, the student by making an extra effort may be able to complete the course without spending an extra year in school.
- (4) Students of exceptional ability and maturity may possibly complete the work of five units a year, and thus shorten the course to three years. This, however, should be attempted only in exceptional cases, and with the positive recommendation of the principal and teachers.
- (5) Students of less than ordinary ability, by spending five years in the high school, and taking three subjects each year, should be able to maintain a record of excellent accomplishment instead of failure.

Chorus singing and a certain amount of physical training may be required without being included in the fifteen required units.

REQUIRED SUBJECTS.

Of the fifteen units required for graduation it is proposed that seven shall be in prescribed branches and eight in electives.

The subjects in which a certain definite amount of work should be required in every high school, and the amount of required work proposed, expressed in units, are as follows:

English, three units.
Mathematics, two units.
Science, one unit.
History, one unit.

These subjects are fundamentally important and afford an introduction to the great departments of human knowledge, with the elements of which every person who proceeds with formal education to the completion of the high-school course should have some acquaintance.

FOREIGN LANGUAGE.

In addition to the seven prescribed units, it is proper that an additional requirement of two units in some foreign language should be made for those whose purpose it may be to prepare for college or university; and under ordinary circumstances students who do not plan definitely to go beyond the high school may properly be advised and urged to undertake the study of the elements of some language besides their own. The value of such study from every point of view is so obvious that principals and teachers are justified in assuming the responsibility of directing the choice of electives, so that every student may receive the benefit of this language training unless there are decided and apparent reasons why such a course would be unprofitable. It may be better to make the effort and to fail in the attempt rather than to sacrifice the opportunity for more extended scholastic attainment through excessive timidity or reluctance to make the initial effort.

PREPARATION FOR COLLEGE.

Fifteen units of work is the amount required for admission to the University of Kansas, and approximately the same amount is required for admission to other universities and colleges. These institutions are becoming more liberal in their specifications for admission; but on account of variation in detail in the requirements for admission to college, the student, early in his high-school course, should consult the catalogue of the university or college which he proposes to enter and should seek the advice of his principal and teachers, so that the proper subjects may be selected.

VOCATIONAL GUIDANCE.

In a similar manner the principal and teachers should offer all the assistance possible in the way of vocational guidance to those students who may need such assistance. Thus not only those who are preparing for college, but every member of the school, will receive help, direction, and encouragement during the whole course of high-school training, and with such advice and assistance his efforts should be directed more and more towards definite objects and pursuits.

THE CHOICE OF ELECTIVES.

In order to avoid a scattering of effort and to secure continuity of plan, it is recommended that the choice of electives should be directed so that every student, even if he does not enter a higher institution, may have the opportunity of doing a certain amount of work which is somewhat advanced.

The following grouping is suggested:

Prescribed studies (seven units):

- (1) English, three units.
- (2) Mathematics, two units.
- (3) Science, one unit.
- (4) History, one unit.

Elective studies (eight units):

- (5) Foreign Language, two units. (Required in preparation for college.)
- (6) Two additional units in the branches named above, viz.: Mathematics, history, science, foreign language, so selected as to make a total of three units in one subject besides English and two units in some additional subject.
- (7) Unrestricted individual choice, four units.

If no work in foreign language should be taken, the amount to be chosen without restriction would be increased to six units.

The following statement is taken from the committee report previously referred to:

"Of the total fifteen units, not less than eleven units should consist of English, foreign language, mathematics, social science (including history), natural science, or other work conducted by recitations and home study.

"The other four units should be left as a margin to be used for additional academic work or for mechanic arts, household science, commercial work, and any other kind of work that the best interests of the student appear to require.

"No limitations should be imposed upon the use of the margin, except that the instruction should be given by competent teachers, with suitable equipment, in classes not too large, and that the student's work should be of a satisfactory grade.

"The recommendation that the subjects from which the margin may be made up should be left entirely unspecified appears to be vital to the progressive development of secondary education. As long as formal recognition must be sought for each new subject, so long will the high school be subservient and not fully progressive. It ought to be possible for any strong high school at any time to introduce into its curriculum a subject that either meets the peculiar needs of the community or that appears to be the most appropriate vehicle for teachers of pronounced individuality."

General List of High School Subjects.

The following list includes all of the subjects which are ordinarily taught in high schools. These are distinguished respectively as required and elective. The required subjects are those in which every high-school student should receive at least elementary instruction. The elective group includes all other high-school subjects which may be elected with the arrangement proposed above, under such restrictions as are made by the individual school.

The list of electives may be extended or curtailed in accordance with local conditions and facilities.

The extent and character of the work proposed and suggestions for the guidance of teachers are set forth in the descriptive matter which follows the outline of the course of study.

GROUP I.—REQUIRED SUBJECTS.

Seven units must be taken.

ENGLISH, 3 units.

MATHEMATICS, 2 units:

Elementary Algebra, 1 unit; Plane Geometry, 1 unit.

SCIENCE, 1 unit, selected from the following:

Physical Geography, $\frac{1}{2}$ unit; Elementary General Science, $\frac{1}{2}$ unit; Physiology, $\frac{1}{2}$ unit; Physics, 1 unit; Chemistry, 1 unit; Botany, 1 unit; Zoölogy, 1 unit; Agriculture, 1 unit.

HISTORY, 1 unit, selected from the following:

Ancient (Greek and Roman) History, Mediæval and Modern History, English History, American History.

GROUP II.—ELECTIVE SUBJECTS.

Eight units must be selected from the following list in accordance with the recommendations made above and under such restrictions as are made by each individual school.

ENGLISH, 1 unit.

MATHEMATICS:

Advanced Algebra, $\frac{1}{2}$ unit; College Algebra, $\frac{1}{2}$ unit; Solid Geometry, $\frac{1}{2}$ unit; Trigonometry, $\frac{1}{2}$ unit.

SCIENCE:

Physical Geography, $\frac{1}{2}$ unit; Elementary General Science, $\frac{1}{2}$ unit; Physiology, $\frac{1}{2}$ unit; Physics, 1 unit; Chemistry, 1 unit; Botany, 1 unit; Zoölogy, 1 unit; Agriculture, 1 unit.

HISTORY:

Ancient (Greek and Roman) History, 1 unit; Mediæval and Modern History, 1 unit; English History, 1 unit; American History, 1 unit; Civics, $\frac{1}{2}$ unit; Economics, $\frac{1}{2}$ unit; Citizenship, $\frac{1}{2}$ unit.

LANGUAGE (Not less than two units should be offered in the first language selected, and no credit of less than one unit should be given for additional work in any language):

Latin, 4 units; Greek, 3 units; German, 3 units; French, 3 units; Spanish, 1 unit.

PSYCHOLOGY, $\frac{1}{2}$ unit.

MUSIC, 1 unit.

VOCATIONAL SUBJECTS (including subjects relating to Art, Industries, Commerce, and Normal Training for Teachers):

Drawing and Design, 2 units; Mechanical Drawing, 2 units; Domestic Art, 1 unit; Domestic Science, 1 unit; Woodworking, 1 unit; Forging, 1 unit; Penmanship, $\frac{1}{2}$ unit; Commercial Arithmetic, $\frac{1}{2}$ unit; Bookkeeping, $\frac{1}{2}$ unit; Commercial Geography, $\frac{1}{2}$ unit; Commercial Law, $\frac{1}{2}$ unit; Stenography, $\frac{1}{2}$ unit or 1 unit; Type-writing, $\frac{1}{2}$ unit or 1 unit; Methods of Teaching and School Management, $\frac{1}{2}$ unit; Review of Arithmetic, $\frac{1}{2}$ unit; Review of Common Branches, 1 unit.

Suggestive Arrangement by Years.

The following arrangement of subjects by years is presented for the purpose of showing the logical sequence of studies and to encourage a reasonable degree of uniformity in the high schools throughout the state. It should not be assumed that all of the branches must be taught in every school. On the contrary, it is hardly probable that the largest and most completely equipped schools will offer all of the branches, and it will be wise for the smaller schools, with fewer teachers, to select those branches in which they are prepared to offer the most thorough and efficient instruction. This will be determined by the peculiar needs of the community, the character of the equipment already provided, and the special talents of the teachers in charge.

The following outlines are suggestive of an arrangement of subjects which may be made for (1) a general course; (2) a college preparatory course; (3) a normal training course; (4) a commercial course; (5) an industrial course; (6) a course adapted to a small school with not more than two or three teachers.

General Course.

Numbers in parentheses refer to consecutive terms of study.

Fifteen units of credit are required for graduation.

Not more than four units of work should ordinarily be attempted in any one year.

Electives should be chosen so as to include three units in some subject besides English and two units in some additional subject.

FIRST YEAR.

FIRST TERM.

Required:

English (1).
Algebra (1).

Elective:

Physical Geography.
Elementary General Science.
Ancient History (1).
Latin (1).
German (1).
Music (1).
Drawing and Design (1).
Mechanical Drawing (1).
Woodworking (1).
Domestic Art (1).
Commercial Arithmetic (1).
Penmanship (1).

SECOND TERM.

Required:

English (2).
Algebra (2).

Elective:

Citizenship.
Ancient History (2).
Latin (2).
German (2).
Music (2).
Drawing and Design (2).
Mechanical Drawing (2).
Woodworking (2).
Domestic Art (2).
Commercial Geography.
Penmanship (2).

SECOND YEAR.

FIRST TERM.

Required:

English (3).
Geometry (1).

Elective:

Botany (1).
Mediæval and Modern History
(1).
Latin (3).
German (3).
Greek (1).
French (1).
Music (3).
Drawing and Design (3).
Mechanical Drawing (3).
Woodworking (3).
Domestic Art (3).
Bookkeeping (1).
Any elective offered in preceding
terms.

SECOND TERM.

Required:

English (4).
Geometry (2).

Elective:

Botany (2).
Mediæval and Modern History
(2).
Latin (4).
German (4).
Greek (2).
French (2).
Music (4).
Drawing and Design (4).
Mechanical Drawing (4).
Woodworking (4).
Domestic Art (4).
Bookkeeping (2).
Any elective offered in preceding
terms.

THIRD YEAR.

FIRST TERM.

Required:

English (5).

Elective:

Algebra (3).
Agriculture (1).
Chemistry (1).
Zoölogy (1).
English History (1).
Latin (5).
German (5).
Greek (3).
French (3).
Forging (1).
Domestic Science (1).
Stenography (1).
Typewriting (1).
Any elective offered in preceding
terms.

SECOND TERM.

Required:

English (6).

Elective:

Solid Geometry.
Agriculture (2).
Chemistry (2).
Zoölogy (2).
English History (2).
Civics.
Latin (6).
German (6).
Greek (4).
French (4).
Forging (2).
Domestic Science (2).
Stenography (2).
Typewriting (2).
Any elective offered in preceding
terms.

FOURTH YEAR.

FIRST TERM.

Required:

History, if not taken before.
Science, if not taken before.

Elective:

English (7).
Advanced Algebra.
Physics (1).
Physiology.
American History (1).
Latin (7).
German (5).
Greek (5).
French (5).
Economics.
Domestic Science (3).
Methods and Management.
Review of Common Branches.
Any elective offered in preceding terms.

SECOND TERM.

Required:

History, if not taken before.
Science, if not taken before.

Elective:

English (8).
Trigonometry.
Physics (2).
Psychology.
American History (2).
Latin (8).
German (6).
Greek (6).
French (6).
Commercial Law.
Domestic Science (4).
Review of Arithmetic.
Review of Common Branches.
Any elective offered in preceding terms.

College Preparatory Course.

Fifteen units are required for graduation. Students who are preparing for admission to college should choose their elective studies so as to include at least two units in some foreign language and three units in some one subject besides English, to be taken from the following: Foreign language; mathematics; history; natural science.

With the limitations proposed above, the student should have freedom to select the remainder of his course in accordance with his dominant interests and aptitude, subject to the restrictions made by the individual school.

Electives should be taken in accordance with the arrangement given in the general course.

Early in his course the student should consult the catalogue of the college which he proposes to enter, so that his studies may be properly directed.

FIRST YEAR.

FIRST TERM.

Required:

English.
Algebra.

Elective:

Physical Geography.
Elementary General Science.
Ancient History.
Latin.
German.
Music.
Vocational Subjects.

SECOND TERM.

Required:

English.
Algebra.

Elective:

Citizenship.
Ancient History.
Latin.
German.
Music.
Vocational Subjects.

SECOND YEAR.

FIRST TERM.

Required:

English.
Geometry.

SECOND TERM.

Required:

English.
Geometry.

SECOND YEAR.	
FIRST TERM.	SECOND TERM.
<i>Elective:</i>	<i>Elective:</i>
Botany.	Botany.
Mediaeval and Modern History.	Mediaeval and Modern History.
Latin.	Latin.
German.	German.
Greek.	Greek.
French.	French.
Vocational Subjects.	Vocational Subjects.
Any elective offered in preceding terms.	Any elective offered in preceding terms.

THIRD YEAR.	
FIRST TERM.	SECOND TERM.
<i>Required:</i>	<i>Required:</i>
English.	English.
<i>Elective:</i>	<i>Elective:</i>
Algebra.	Solid Geometry.
Agriculture.	Agriculture.
Chemistry.	Chemistry.
Zoölogy.	Zoölogy.
English History.	English History.
Latin.	Latin.
German.	German.
Greek.	Greek.
French.	French.
Vocational Subjects.	Vocational Subjects.
Any elective offered in preceding terms.	Any elective offered in preceding terms.

FOURTH YEAR.	
FIRST TERM.	SECOND TERM.
<i>Required:</i>	<i>Required:</i>
History, if not taken before.	History, if not taken before.
Science, if not taken before.	Science, if not taken before.
<i>Elective:</i>	<i>Elective:</i>
English.	English.
Advanced Algebra.	Trigonometry.
Physics.	Physics.
Physiology.	Psychology.
American History.	American History.
Latin.	Latin.
German.	German.
Greek.	Greek.
French.	French.
Vocational Subjects.	Vocational Subjects.
Any elective offered in preceding terms.	Any elective offered in preceding terms.

Normal Training Course.

The following course meets the requirements of the State Board of Education for high schools which are approved for normal training.

If agriculture and domestic science are offered in the third year, this course will also satisfy the requirements of the State Board with reference to the state appropriation for these subjects.

Electives should be chosen in accordance with the arrangement given in the general course.

Fifteen units are required for graduation. The course should include

three units in some subject besides English, and two units in some additional subject.

If two units in a foreign language are included in the electives, this course will be satisfactory for admission to most colleges.

FIRST YEAR.	
FIRST TERM.	SECOND TERM.
English.	English.
Algebra.	Algebra.
Electives.	Electives.

SECOND YEAR.	
FIRST TERM.	SECOND TERM.
English.	English.
Geometry.	Geometry.
Electives.	Electives.

THIRD YEAR.	
FIRST TERM.	SECOND TERM.
English.	English.
Physiology.*	Psychology.*
Algebra.	Civics.
Electives.	Electives.

FOURTH YEAR.	
FIRST TERM.	SECOND TERM.
American History.	American History.
Physics.	Physics.
Methods and Management.	Arithmetic.
Reviews.	Reviews.

Twelve weeks each in Geography, Grammar, and Reading.

Commercial Course.

Fifteen units are required for graduation. Three units of credit should be obtained in some one subject besides English, and two units in some additional subject.

In branches which do not require preparation by the student outside of the recitation a unit of credit is given for a course of daily exercises extending through the year with double, or eighty-minute periods; and a half unit of credit is given for a course extending through a year with forty-minute periods.

Electives should be chosen in accordance with the arrangement in the general course.

FIRST YEAR.	
FIRST TERM.	SECOND TERM.
<i>Required:</i>	<i>Required:</i>
English.	English.
Algebra.	Algebra.
<i>Elective:</i>	<i>Elective:</i>
Physical Geography.	Citizenship.
Elementary General Science.	History.
History.	Language.
Language.	Music.
Music.	Penmanship.
Penmanship.	Commercial Geography.
Commercial Arithmetic.	Vocational Subjects.
Vocational Subjects.	

* Physiology and psychology may be taken in the third year by students enrolled in the normal-training course; in all other courses these subjects are placed in the fourth year.

SECOND YEAR.

FIRST TERM.

Required:

English.
Geometry.

Elective:

Science.
History.
Language.
Bookkeeping.
Vocational Subjects.

SECOND TERM.

Required:

English.
Geometry.

Elective:

Science.
History.
Language.
Bookkeeping.
Vocational Subjects.

THIRD YEAR.

FIRST TERM.

Required:

English.

Elective:

Algebra.
Science.
History.
Language.
Stenography.
Typewriting.
Vocational Subjects.

SECOND TERM.

Required:

English.

Elective:

Solid Geometry.
Science.
History.
Language.
Stenography.
Typewriting.
Vocational Subjects.

FOURTH YEAR.

FIRST TERM.

Required:

History, if not taken before.
Science, if not taken before.

Elective:

English.
College Algebra.
Science.
History.
Language.
Economics.
Vocational Subjects.

SECOND TERM.

Required:

History, if not taken before.
Science, if not taken before.

Elective:

English.
Trigonometry.
Science.
Psychology.
History.
Language.
Commercial Law.
Vocational Subjects.

Industrial Course.

Fifteen units are required for graduation. Three units of credit should be obtained in some one subject besides English, and two units in some additional subject.

In branches which do not require preparation by the student outside of the recitation a unit of credit is given for a course of daily exercises extending through the year with double, or eighty-minute, periods; and a half unit of credit is given for a course extending through the year with forty-minute periods.

Electives should be chosen in accordance with the arrangement in the general course.

FIRST YEAR.

FIRST TERM.

Required:

English.
Algebra.

SECOND TERM.

Required:

English.
Algebra.

FIRST TERM.		FIRST YEAR.	
<i>Elective:</i>		<i>Elective:</i>	SECOND TERM.
Physical Geography.		Citizenship.	
Elementary General Science.		History.	
History.		Language.	
Language.		Music.	
Music.		Drawing and Design.	
Drawing and Design.		Mechanical Drawing.	
Mechanical Drawing.		Woodworking.	
Woodworking.		Domestic Art.	
Domestic Art.		Commercial Subjects.	
Commercial Subjects.			
FIRST TERM.		SECOND YEAR.	
<i>Required:</i>		<i>Required:</i>	SECOND TERM.
English.		English.	
Geometry.		Geometry.	
<i>Elective:</i>		<i>Elective:</i>	
Science.		Science.	
History.		History.	
Language.		Language.	
Music.		Music.	
Drawing and Design.		Drawing and Design.	
Mechanical Drawing.		Mechanical Drawing.	
Woodworking.		Woodworking.	
Domestic Art.		Domestic Art.	
Commercial Subjects.		Commercial Subjects.	
Any elective offered in preceding term.		Any elective offered in preceding term.	
FIRST TERM.		THIRD YEAR.	
<i>Required:</i>		<i>Required:</i>	SECOND TERM.
English.		English.	
<i>Elective:</i>		<i>Elective:</i>	
Algebra.		Solid Geometry.	
Agriculture.		Agriculture.	
Science.		Science.	
History.		History.	
Language.		Language.	
Forging.		Forging.	
Domestic Science.		Domestic Science.	
Commercial Subjects.		Commercial Subjects.	
Any elective offered in preceding terms.		Any elective offered in preceding terms.	
FIRST TERM.		FOURTH YEAR.	
<i>Required:</i>		<i>Required:</i>	SECOND TERM.
History, if not taken before.		History, if not taken before.	
Science, if not taken before.		Science, if not taken before.	
<i>Elective:</i>		<i>Elective:</i>	
English.		English.	
Advanced Algebra.		Trigonometry.	
Physics.		Physics.	
History.		History.	
Language.		Language.	
Economics.		Commercial Law.	
Forging.		Forging.	
Domestic Science.		Domestic Science.	
Any elective offered in preceding terms.		Any elective offered in preceding terms.	

High Schools with Two or Three Teachers.

The following selection of subjects is suggested as a suitable arrangement for schools in which the number of students enrolled does not justify the employment of more than three teachers; but the list of electives should be determined in accordance with the local conditions and resources.

Fifteen units are required for graduation.

Electives should be arranged so that the student may include in his course three units in some subject besides English, and two units in some additional subject.

If the special branches required in the normal-training course are offered, the result will be a combination course, which would be satisfactory in many of the smaller high schools.

FIRST YEAR.

FIRST TERM.

Required:

English.
Algebra.

Elective:

Physical Geography, or
Elementary General Science.
Ancient History.
Latin.
German.
Vocational Subject.

SECOND TERM.

Required:

English.
Algebra.

Elective:

Citizenship.
Ancient History.
Latin.
German.
Vocational Subject.

SECOND YEAR.

FIRST TERM.

Required:

English.
Geometry.

Elective:

Botany.
Latin.
German.
Vocational Subject.
Any elective offered in preceding terms.

SECOND TERM.

Required:

English.
Geometry.

Elective:

Botany.
Latin.
German.
Vocational Subject.
Any elective offered in preceding terms.

THIRD YEAR.

FIRST TERM.

Required:

English.

Elective:

Algebra.
Zoölogy.
Agriculture.
Latin.
German.
Vocational Subject.
Any elective offered in preceding terms.

SECOND TERM.

Required:

English.

Elective:

Solid Geometry.
Civics.
Zoölogy.
Agriculture.
Latin.
German.
Vocational Subject.
Any elective offered in preceding terms.

FOURTH YEAR.

FIRST TERM.

Required:

Science, if not taken before.
History, if not taken before.

SECOND TERM.

Required:

Science, if not taken before.
History, if not taken before.

FOURTH YEAR.	
FIRST TERM.	SECOND TERM.
<i>Elective:</i>	<i>Elective:</i>
English.	English.
Physics.	Physics.
Physiology.	Psychology.
American History.	American History.
Latin.	Latin.
Vocational Subject.	Vocational Subject.
Any elective offered in preceding terms.	Any elective offered in preceding terms.

The elective subjects which may be offered in any school should be determined in consideration of the requirements of the local community, the facilities which are provided in the way of equipment, and the special talents of available teachers.

As a matter of economy and convenience, it is often desirable to combine classes so as to permit students in the second and third years or in the third and fourth years to take the same subject. For example, botany may be offered for both second- and third-year students; and in the year following physics may be offered for the same pupils in the third and fourth years of the course; and other similar combinations may be made advantageously.

High Schools with Less than Four-year Courses.

Schools which are able to offer only one, two, or three years of high-school work should confine themselves to those branches which are specified in the corresponding years of the general course above, and no more electives should be offered than can be efficiently taught. Furthermore, the same electives should be offered from year to year, so that a student who begins his course with a certain plan may not be compelled to change that plan without adequate reason for so doing.

Description of Courses.

The following descriptive matter has been prepared for the purpose of presenting definite and practical suggestions on the scope and character of the instruction which should be provided in the various branches included in the high-school curriculum.

ENGLISH.

Three units required; one unit elective.

The elements of the course of study in English are literature, composition and rhetoric, and grammar.

LITERATURE.

The aim of the high-school course in literature is to develop in the pupil a liking for good reading, the power to understand and appreciate what he reads, and familiarity with the best in literature.

COMPOSITION AND RHETORIC.

The aim of the high-school course in composition and rhetoric is to develop the power of the pupil to express in clear, accurate, idiomatic English the ideas that come to him from the whole range of his experience.

Oral Expression.—In connection with all work in English, particularly in the first year, attention should be paid to the development of clearness in oral expression. Pupils should not only be helped in every way to overcome common errors in speech, but should also be trained to express themselves clearly and forcibly in sustained discourse. In this work constant attention should be given to distinctness of utterance, to pronunciation, inflection, and phrasing.

Spelling and Punctuation.—Throughout the course instruction is to be given in spelling and punctuation, as the need may arise. The range of instruction in spelling should include proper names occurring in the literature read, words misspelled in themes, and, in general, all words in the pupil's vocabulary.

During the earlier part of the course only a few of the more important principles of punctuation should be reviewed; but before the close of the last year, every pupil should have received such instruction as will enable him to punctuate fully and accurately.

GRAMMAR.

The aim of the study of grammar in the high school should be to aid in the mastery of expression, and in the appreciation of literature. While grammatical accuracy should be vigorously exacted in connection with all written work, the study of grammar is not to be regarded as an end in itself. If it is necessary to review grammar in the high school, it is recommended that there be a gradual and progressive survey of the subject in connection with exercises and recitations in composition, for the purpose of explaining principles through their practical application in writing and speaking, and incidentally to teach classification and terminology as a means towards this end.

SUGGESTIONS.

(a) Throughout the course, pupils should be taught, incidentally, how to use dictionaries, encyclopedias, and general works of reference.

(b) Teachers should encourage a systematic use of the library, wherever one is accessible, to aid in the study of literature and to give the pupil's experience in collecting data, in judging the relative importance of historical and biographical facts, and in using matter thus obtained in oral and written compositions.

(c) There should be a close correlation between the work in English and other branches of instruction. In part this may be accomplished by selecting as the subject matter of themes information acquired by pupils in other departments. All school activities may be made to contribute material for themes. The new interest in debating in many high schools will bring more attention to the study of English, especially of argumentation. Below is given a suggested course in English for the high schools of the state of Kansas. The outline is designed to show in general the amount and character of the English work to be considered in each year of the course. The classics to be read are graded somewhat carefully. The first year deals with simple narrative and descriptive prose and poetry, and with Shakespeare in a tragedy of universal appeal; the second year furnishes work in narration and exposition in poetry and prose; and the third year deals with more difficult poetry, a tragedy, an essay, and an argumentative speech.

The work in composition is related closely to the kind of literature studied, not so much in subject matter, as in the character of the appeal. Thus in the first and second years narration, description, and exposition are emphasized; and in the third, exposition and argumentation.

Outline of the High School Course in English.

ENGLISH (1): FIRST YEAR, FIRST TERM.

LITERATURE (three periods weekly).

Study:

"Sketch Book" (six selections).....Washington Irving.
 "Autobiography".....Benjamin Franklin.

Read (two to be chosen):

"Courtship of Miles Standish".....Henry W. Longfellow.
 "Evangeline".....Henry W. Longfellow.
 "The Man Without a Country".....Edward Everett Hale.
 "The Last of the Mohicans".....James Fenimore Cooper.
 "Prose Tales".....Edgar Allan Poe.

COMPOSITION (two periods weekly).

Study: "A Progressive Course in English for Secondary Schools," Stebbins—Part I, chapters 1, 2, 3, and 11.

Students should present at least one theme a week. The criticism of the teacher should be largely constructive, although it must deal with matters of grammar, spelling, and punctuation.

The work of the term is as follows:

1. Short narrative themes, both oral and written, based on the experience of the pupil and on the literature of the term.
2. A review of capitalization and of the simpler principles of punctuation. Elementary study of the principles of unity and coherence as applied to the whole composition and to sentences in composition.

GRAMMAR.

The study of the sentence and the application of the principles of grammar in composition.

SUGGESTIONS FOR TEACHING.

LITERATURE.

1. Study the life of Irving before reading the "Sketch Book," so that the pupil may feel the personality of Irving.

2. Take opportunity during the term to bring before the class other selections from Irving's writings. Choice may be made from the following:

"Knickerbocker's History of New York": Book I, chapter 1; book III, chapter 1; book III, chapter 3.

"Sketch Book": Christmas Sketches.

"Alhambra": Palace of the Alhambra; Court of the Lions; Legend of Prince Ahmed Al Kamel.

"Life of Washington": Washington at Valley Forge, volume III, chapter 31; Siege and Surrender of Yorktown, volume IV, chapter 28.

3. It is not necessary to require a close perusal of all of the "Autobiography." Teach it by topics, selecting the parts that seem best to reveal the author. For instance, show how Franklin learned to write by diligent practice and how much use he made of this accomplishment throughout his life.

4. From the books suggested for collateral reading, help the pupils to choose what will cultivate in them a taste for reading; for "the uplifting of the democratic masses depends on this implanting at school of the taste for good reading."

COMPOSITION.

1. Require both oral and written themes—isolated paragraphs from 150 to 300 words long.

2. Make the assignment of theme subjects in topic sentences; as, for example—

(a) I well remember the first fish I caught.

(b) I had a narrow escape while learning to ride horseback.

3. The collateral reading will furnish material for some of the oral themes. An episode from a long story, well selected and condensed, will interest the class, the members of which are reading different books.

4. Collateral reading may be tested by lists of questions given to the pupil after he has completed his first reading. From these a certain number may be selected for oral or written examination.

ENGLISH (2): FIRST YEAR, SECOND TERM.

LITERATURE (three periods weekly).

Study:

"Lady of the Lake".....Sir Walter Scott.
 "Julius Cæsar".....William Shakespeare.

Read (two to be chosen):

"Cricket on the Hearth".....Charles Dickens.
 "Christmas Carol".....Charles Dickens.
 "Treasure Island".....Robert Louis Stevenson.
 "Tom Brown's School Days".....Thomas Hughes.
 "Tales from Shakespeare".....Charles and Mary Lamb.

COMPOSITION (two periods weekly).

Study: "A Progressive Course in English for Secondary Schools," Stebbins—Part I, chapters 4, 5, 6, and 11 (reviewed).

The work of the term is as follows:

1. Short compositions, both oral and written, based on the experience of the pupil and on the literature read. Emphasis should be laid on description. The subjects chosen should be simple in character, and should relate to what the pupil has seen in real life or in imagination.

2. Elementary study of unity and coherence in the composition and in the sentence. The function of the paragraph.

GRAMMAR.

Continuation of the work of the previous half year.

SUGGESTIONS FOR TEACHING.

LITERATURE.

1. In teaching the classics required for study emphasize the subject matter. If the pupil knows the story thoroughly, he is prepared to examine the classic critically later on when it is recalled to his mind by his study of the history of literature.

COMPOSITION.

1. Emphasize chapter 6 of Stebbins, which deals with letter writing; and give attention to the substance of the letter as well as to the form.

ENGLISH (3): SECOND YEAR, FIRST TERM.

LITERATURE (three periods weekly).

Study:

"The Vision of Sir Launfal".....James Russell Lowell.

"The Idylls of the King".....Alfred Tennyson.

Select the three following: Gareth and Lynette; Lancelot and Elaine; The Passing of Arthur.

"The Merchant of Venice".....William Shakespeare.

Read (two to be chosen):

"Heratius"Thomas Babington Macaulay.

"Snow-Bound"John Greenleaf Whittier.

"Enoch Arden"Alfred Tennyson.

"The Ancient Mariner".....Samuel Taylor Coleridge.

"The Cotter's Saturday Night".....Robert Burns.

"The Deserted Village".....Oliver Goldsmith.

COMPOSITION (two periods weekly).

Study: "A Progressive Course in English for Secondary Schools," Stebbins—Part I, chapters 8 and 11 (reviewed); part II, chapters 1, 2, and 6.

The work of the term is as follows:

1. Short themes, both oral and written, of various types. Emphasis should be laid on narration and description, with a view to an amalgamation of the two kinds. The subjects chosen should be simple in character and should relate to what the student has seen in real life or in imagination.

2. Further study of paragraph structure with respect to unity, coherence, and emphasis; the use of the topic sentence; connectives; the methods of transition.

GRAMMAR.

Study of tenses and modes, their distinctions and meaning; consistency in their use in composition.

SUGGESTIONS FOR TEACHING.

LITERATURE.

1. In teaching the poems to be studied and those to be read during this term, vocal rendering becomes increasingly important. The pupils should be required to interpret the poems by the voice, for there is suggestion in the music of the verse; and to interpret by the voice requires as much study as to paraphrase and explain in equivalent words.

2. The poems recommended for collateral reading should be read and enjoyed, but should not be subjected to close analysis. They present their

pictures and emotions rapidly and vividly and tell their story so simply that the reader can not miss it.

3. Parts of these poems should be committed to memory, so as to store the mind "with the priceless treasure of the noblest thoughts and feelings that have been uttered by men."

The effort to commit to memory certain assignments affords the student excellent mental drill and at the same time increases his working vocabulary.

COMPOSITION.

1. In teaching description, combine chapter 8 of part I and chapter 2 of part II according to the following plan:

Lesson 1: Part I, chapter 8, pages 145-153.

Lesson 2: Part I, chapter 8, pages 153-160; part II, chapter 2, pages 28-36.

Lesson 3: Part I, chapter 8, pages 160-165; part II, chapter 2, pages 36-38.

Lesson 4: Part I, chapter 8, pages 165-171; part II, chapter 2, pages 52-55.

Lesson 5: Part II, chapter 2, pages 38-52, 58-61.

2. Description: The requirements should show a distinct advance over those of the first year in subject and method of treatment. Descriptions of persons, of landscapes, of buildings, of scenes of action, and descriptions from both fixed and moving points of view are illustrations of the variety of the problems that may be assigned.

3. Narration: The themes may include anecdotes, historical sketches, biographical sketches, and stories with simple plots.

ENGLISH (4): SECOND YEAR, SECOND TERM.

LITERATURE (three periods weekly).

Study:

"Ivanhoe".....Sir Walter Scott.

"Silas Marner".....George Eliot.

Read (two to be chosen):

"The House of the Seven Gables".....Nathaniel Hawthorne.

"The Tale of Two Cities".....Charles Dickens.

"David Copperfield".....Charles Dickens.

"Lorna Doone".....R. D. Blackmore.

COMPOSITION (two periods weekly).

Study: "A Progressive Course in English in Secondary Schools," Stebbins—Part II, chapters 3, 4, 7, and 8.

The work of the term is as follows:

1. Short themes, both oral and written, of various types. Emphasis should be laid on exposition. The subjects chosen should be for the most part concrete, carefully limited, and within the pupil's experience. Practice should be given in defining terms. Moreover, there should be some work in elementary argumentation, based upon questions familiar to the pupil. Pupils should have practice in framing propositions on topics of interest to them, in defining terms, and in differentiating introduction, proof, and conclusion. Emphasis should be laid on the distinction between assertion and proof.

GRAMMAR.

A systematic review of the principles of English grammar.

SUGGESTIONS FOR TEACHING.

COMPOSITION.

1. Expository themes may well deal with topics suggested by the reading, as chivalry, tournaments, weaving, witchcraft, etc.; and with current topics, especially questions relating to municipal affairs or community interests.

2. For practice debates select propositions dealing with school life and problems; as

a. Only three years of English should be required in the high school.

b. Compulsory manual training should be made a part of every high-school course of study.

c. At least one year of Latin should be required of all high-school students.

ENGLISH (5): THIRD YEAR, FIRST TERM.

LITERATURE (three periods weekly).

Study:

"Macbeth" William Shakespeare.
Milton's Minor Poems.

"A First View of English and American Literature," Moody, Lovett, and Boynton, chapters 1 to 9.

Read (two to be chosen):

"Kenilworth" Sir Walter Scott.

"Henry VIII" William Shakespeare.

"Henry VIII and His Court" Louise Mülbach.

"Pilgrim's Progress" John Bunyan.

"Paradise Lost" (books I and II) John Milton.

Homer's "Iliad" Translated by Bryant or Pope.

Homer's "Odyssey" Translated by Bryant, Pope, or Palmer.

"Henry V" William Shakespeare.

COMPOSITION (two periods weekly).

The work of the term is as follows:

1. Short themes of various types.

2. Continued study of exposition and argumentation, which should include the study of various methods of paragraph development and should be pursued with increasing insistence on unity, coherence, and emphasis in the paragraph.

3. Study of diction; synonyms and antonyms; specific and general terms; words frequently confused.

GRAMMAR.

Study of connectives and the various functions of phrases and clauses.

ENGLISH (6): THIRD YEAR, SECOND TERM.

LITERATURE (three periods weekly).

Study:

"Life of Johnson" Thomas Babington Macaulay.

"Speech on Conciliation" Edmund Burke.

"A First View of English and American Literature," Moody, Lovett, and Boynton, chapter 10 to the end.

Read (two to be chosen):

"Pride and Prejudice" Jane Austin.

"Henry Esmond" William Makepeace Thackeray.

"Vanity Fair" William Makepeace Thackeray.

"Vicar of Wakefield" Oliver Goldsmith.

"Gulliver's Travels" (parts) Jonathan Swift.

"Palamon and Arcite" John Dryden.

"David Copperfield" Charles Dickens.

"Jane Eyre" Charlotte Brontë.

"The Cloister and the Hearth" Charles Reade.

"The Spectator" (selections) Joseph Addison.

COMPOSITION (two periods weekly).

The work of the term is as follows:

1. Themes of various lengths.
2. Continued work in exposition, which should include at least one theme of some length carefully developed through a preliminary outline and demanding clear explanation of a somewhat complex, though familiar, object of first-hand knowledge.
3. Continuation of the study of diction. Further study of the structure of the whole composition and of the methods of paragraph development.

GRAMMAR.

Study of various functions of the infinitive and participle.

SUGGESTIONS FOR TEACHING.

LITERATURE.

1. The questions for the study of classics given in chapter 9, part II, of Stebbins' "Progressive Course in English" will be helpful in the teaching of English (5) and (6).
2. Teach Burke's Speech with the aid of a topical outline, such as the Riverside Press series of classics gives in the paragraph topics of its edition of the Speech.
3. Require the pupils to make a brief of certain parts of the speech only; as,
 - a. The six causes of the spirit of liberty in the colonies.
 - b. Burke's objections to the use of force in dealing with the colonies.

COMPOSITION.

1. The oral themes may well be on topics from the lives of Macaulay and Johnson, and reports on the history of England and America preceding the American Revolution. Such topics as the Magna Charta, the Bill of Rights, the character of George III, and the Navigation Acts, the Stamp Act, and the spirit of resistance shown in the various colonies, prepare for the study of the Speech.

ENGLISH (7): FOURTH YEAR, FIRST TERM. (Optional.)

LITERATURE.

Study: "Argumentation and Debate" . . . Denney, Duncan, and McKinney.

COMPOSITION.

The work of the term is as follows:

1. Briefs, written arguments, oral debates and discussions.
2. At least one argument of considerable length, developed through formal introduction and brief.
3. The topics chosen for debate should deal with such questions of the day as are well within the grasp of the pupils.
4. Discussions by previously designated members of the class should follow the formal debate.

ENGLISH (8): FOURTH YEAR, SECOND TERM. (Optional.)

COMPOSITION AND STORY TELLING.

Study:

"Composition and Rhetoric" (revised edition) . . . Herrick and Damon.

Read:

"Some Great Stories and How to Tell Them" . . Richard Thomas Wyche.
 "Self Cultivation in English" George H. Palmer.

The composition work of the term is as follows:

1. Short themes of various types.

2. A composition of considerable length. The student should have perfect freedom in the choice of literary form, and is expected to express himself correctly and forcibly, in clear, idiomatic English. This production should be a thorough test of his ability to write.

3. The work in story telling should be conducted on the same plan as oral themes.

Textbooks.

Although for each English subject there is a prescribed state text, for supplementary and other purposes it is necessary for teachers to know what other textbooks are available in each subject, and some of the best of these should be in the school library. Almost any recently published text will be found useful and entirely satisfactory for the conditions it was designed to meet; but, on the other hand, it is impossible for any text to be satisfactory under all conditions; and the problem of the teacher, if free to choose, is to find the book that best suits the conditions of his own classes; or, if the book is prescribed, to adapt to it those conditions.

Editions of the classics listed in the published requirements for college entrance may be had of any educational publisher. For reviewing the history of English literature, besides standard reference works, a list of which follows, it is of advantage to have at hand in the school library a number of good textbooks for comparison, such as those of Pancoast, Halleck, Scudder, Moody and Lovett, Simonds, Newcomer, and Long. The authorized text is that of Moody, Lovett, and Boynton, adopted by the State Textbook Commission in 1909.

Good textbooks in composition and rhetoric, in the general order of publication, are those of Genung, Newcomer, Webster, Mead and Gordy, Scott and Denny (revised), Lockwood and Emerson, Smith and Thomas, Herrick and Damon (revised), Gardiner and Kittredge and Arnold, Kavanagh and Beatty, Espenshade, Huntingdon, Lamont, Shackford-Judson, Thomas and Howe, Brooks and Hubbard, Baldwin, and Canby. In considerable demand at the present time are volumes of illustrative selections to accompany the formal text in composition; and the more recent of these are Nutter and Hersey and Greenough, Grose, and Berkeley, intended primarily for college use, but serving equally well for advanced high-school work. Also popular to lighten the labor of both teacher and class and to accompany a regular text are handbooks of rules and usages, such as those of Carson and Woolley. As special aids for high-school debaters may be named Alden's Art of Debate, and, more recently published, Pattee's Practical Argumentation, Thomas's Manual of Debate, and Denny, Duncan and McKinney's Argumentation and Debate.

BOOKS FOR THE ENGLISH LIBRARY.

For the study of English the only laboratory required is a well-equipped library. The following list of books has been prepared to show what such a library should contain in addition to dictionaries and standard editions of the works of English writers. Besides collections of prose and verse, the list includes classified titles of valuable reference works in seventeen or more subjects belonging to English literature, English composition and English language. Groups and authors are in alphabetical order.

I. AMERICAN LITERATURE.

Newcomer.—American Literature; Scott, Foresman & Co., 1902; \$1.

Onderdonk.—History of American Verse; McClurg, 1901; \$1.25.

Page.—Chief American Poets; Houghton, 1905; \$1.75.

Pattee.—History of American Literature; Silver, Burdett & Co., revised, 1909; \$1.20.

Simonds.—Students' History of American Literature; Houghton, 1909; \$1.10.

- Stanton.—Manual of American Literature; Putnam's, 1909; \$1.75.
 Stedman.—An American Anthology; Houghton, 1900; \$2.
 Stedman.—Poets of America; Houghton, 1885; \$2.25.
 Trent.—History of American Literature; Appleton, 1903; \$1.40.

II. BIOGRAPHIES.

- American Men of Letters Series; Houghton; each \$1.25.
 English Men of Letters Series; early issues, Macmillan; each 40 cents.
 English Men of Letters Series; later issues, Macmillan; each 75 cents.
 Great Writers Series; cheaper edition, W. Scott, London; each 40 cents.
 Hinckman and Gummere.—Lives of Great English Writers—Chaucer to
 Browning; Houghton, 1908; \$1.50.
 Vedder.—American Writers of To-day; Silver, Burdett & Co., 1895; \$1.50.

III. COMPOSITION—EXPOSITION, ARGUMENT, AND DEBATE.

- Alden.—Art of Debate; Holt, 1900; \$1.
 Denney, Duncan and McKinney.—Argumentation and Debate; American
 Book Company, 1910; \$1.25.
 Foster.—Argumentation and Debating; Houghton, 1907; \$1.25.
 Laycock and Scales.—Argumentation and Debate; Macmillan, 1904; \$1.10.
 Mitchell and Carpenter.—Exposition in Classroom Practice; Macmillan,
 1906; 70 cents.
 Pattee.—Practical Argumentation; Century, 1909; \$1.10.
 Perry.—Exposition; American Book Company, 1908; \$1.
 Thomas.—Manual of Debate; American Book Company, 1910; 80 cents.

IV. COMPOSITION—GENERAL WORKS.

- Baldwin.—Composition, Oral and Written; Longmans, 1909; \$1.20.
 Bates.—Talks on Writing English, first series; Houghton, 1896; \$1.50.
 Bates.—Talks on Writing English, second series; Houghton, 1901; \$1.30.
 Berkeley.—A College Course in Writing from Models; Holt, 1910; \$1.25.
 Canly, Seidel, and others.—English Composition in Theory and Practice;
 Macmillan, 1909; \$1.25.
 Scott and Denney.—Paragraph Writing, revised edition; Allyn & Bacon,
 1910; \$1.25.
 Seward.—Note Taking; Allyn & Bacon, 1910; 50 cents.
 Thomas and Howe.—Composition and Rhetoric; Longmans, 1908; \$1.20.
 Woolley.—Handbook of Composition; Heath, 1908; 80 cents.
 Woolley.—Mechanics of Writing; Heath, 1909; \$1.

V. CRITICISM AND REPRINTS.

- Bates.—Talks on Teaching Literature; Houghton, 1905; \$1.30.
 Bates.—Talks on the Study of Literature; Houghton, 1897; \$1.50.
 Brewster.—Literary Criticism; Macmillan, 1907; \$1.10.
 Everyman's Library, a growing series of reprints, now numbering about
 450 vols.; Dutton; each, 35 cents.
 Manly.—English Prose (1137-1890); Ginn, 1909; \$1.50.
 Pancoast.—Standard English Prose; Holt, 1902; \$1.50.
 Shuman.—How to Judge a Book; Houghton, 1910; \$1.25.
 Winchester.—Principles of Literary Criticism; Macmillan, 1900; \$1.50.

VI. DRAMA.

- Caffin.—Appreciation of the Drama; Baker & Taylor, 1908; \$1.50.
 Matthews.—A Study of the Drama; Houghton, 1910; \$1.50.
 Matthews.—Development of the Drama; Scribner's, 1904; \$1.25.
 McEwan.—Freytag's Technique of the Drama; Scott, Foresman & Co.,
 1895; \$1.50.
 Price.—Technique of the Drama; Brentano, 1892; \$1.50.
 Thorndike.—Tragedy; Houghton, 1908; \$1.50.
 Woodbridge.—The Drama; Allyn & Bacon, 1898; 80 cents.

VII. GENERAL LITERATURE—REFERENCE WORKS.

- Botta.—Handbook of Universal Literature; Houghton, latest edition; \$2.
 Gosse, editor.—Literatures of the World Series; Appleton; each vol. about \$1.50.
 Green.—Short History of the English People; American Book Company, 1896; \$1.20.
 Lollie.—History of Comparative Literature (trans. by Power); London, Hodder & Stoughton, 1906; about \$2.
 Ploetz.—Epitome of Universal History; Houghton, latest edition, 1905; \$2.
 Saintsbury, editor.—Periods of European Literature; Scribner's; a series, each vol. \$1.50.
 Strutt.—Sports and Pastimes of the English People; London, Chatto & Windus, 1898; about \$1.

VIII. GRAMMAR AND LANGUAGE HISTORY.

- Abbott.—Shakesperian Grammar; Macmillan, 1896; \$1.50.
 Bradley.—Making of English; Macmillan, 1904; \$1.
 Carpenter.—English Grammar; Macmillan, 1906; 75 cents.
 Clodd.—Story of the Alphabet; Appleton, 1900; 35 cents.
 Emerson.—History of the English Language; Macmillan, 1894; \$1.24.
 Jespersen.—Growth and Structure of the English Language; Lemcke & Buechner, 1906; \$1.
 Jespersen.—Progress in Language; Macmillan, 1894; \$1.90.
 Kellner.—Historical Outlines of English Syntax; Macmillan, 1892; \$1.40.
 Krapp.—Elements of English Grammar; Scribner's, 1908; 80 cents.
 Leonard.—Grammar and its Reasons; A. S. Barnes, 1908; \$1.50.
 Lounsbury.—History of the English Language; Holt, 1894; \$1.12.
 Morris.—Historical Outlines of English Accidence, revised by Kellner and Bradley; Macmillan, 1895; \$1.40.
 Nesfield.—English Grammar, Past and Present; Macmillan, 1898; \$1.10.
 Scott and Buck.—English Grammar; Scott, Foresman & Co., 1906; 60 cents.
 Sweet.—History of Language; Macmillan, 1900; \$1.
 Sweet.—New English Grammar, part I; Oxford University Press, 1892; \$2.60.
 Sweet.—New English Grammar, part II; Oxford University Press; 1898; 90 cents.
 West.—English Grammar; Macmillan, 1894; 60 cents.
 Wyld.—Growth of English; Dutton, 1907; \$1.
 Wyld.—Historical Study of the Mother Tongue; Murray, 1906; about \$2.

IX. LANGUAGE—GENERAL REFERENCES.

- Fernald.—Connectives of English Speech; Funk and Wagnalls, 1903; \$1.50.
 Fernald.—Synonyms, Antonyms, and Prepositions; Funk and Wagnalls, 1897; \$1.50.
 Greencough and Kittredge.—Words and Their Ways in English Speech; Macmillan, 1901; \$1.10.
 Krapp.—Modern English, Its Growth and Use; Scribner's, 1909; \$1.25.
 Lounsbury.—English Spelling and Spelling Reform; Harper's, 1909; \$1.25.
 Lounsbury.—Standard of Pronunciation in English; Harper's, 1903; \$1.20.
 Lounsbury.—Standard of Usage in English; Harper's, 1908; \$1.50.
 Phyfe.—Twelve Thousand Words Often Mispronounced; Putnam's, latest edition; \$1.25.
 Skeat.—Etymological Dictionary of the English Language; Oxford, University Press; third edition, 1908; \$11.

X. LITERATURE—HELPS IN STUDY AND TEACHING.

- Carpenter, Baker and Scott.—The Teaching of English; Longmans, 1903; \$1.50.
 Chubb.—The Teaching of English; Macmillan, 1902; \$1.
 Gayley.—Classic Myths in English Literature; Ginn, 1893; \$1.65.
 Guerber.—Legends of the Middle Ages; American Book Company, 1896; \$1.50.
 Guerber.—Myths of Greece and Rome; American Book Company, 1893; \$1.50.
 Guerber.—Myths of Northern Lands; American Book Company, 1895; \$1.50.
 Heydrick.—How to Study Literature; Hinds, Noble & Eldridge, 1902; 75 cents.
 Hopkins.—Handbook on the Teaching of English; Scott, Foresman & Co., 1904; 25 cents.
 Ryland.—Chronological Outlines of English Literature; latest edition, Macmillan, 1907; \$1.40.
 Skinner.—Myths and Legends of our Own Land; Lippincott, 1896; 2 vols., each \$1.50.
 Thomas.—How to Teach English Classics; Houghton, 1910; 15 cents.
 Whitcomb.—Chronological Outlines of American Literature; Macmillan, 1894; \$1.25.

XI. LITERATURE—HISTORIES.

- Brooke.—English Literature from the Beginning to the Norman Conquest; Macmillan, 1898; \$1.50.
 Brooke.—History of Early English Literature; Macmillan, 1892; \$2.50.
 Gosse.—History of English Literature in the Eighteenth Century; Macmillan, 1891; \$1.
 Long.—English Literature, Textbook of; Ginn & Co., 1908; \$1.35.
 Newcomer.—English Literature, Textbook of; Scott, Foresman & Co., 1906; \$1.25.
 Saintsbury.—Elizabethan Literature; Macmillan, 1887; \$1.50.
 Saintsbury.—History of Nineteenth Century Literature; Macmillan, 1896; \$1.50.
 Saintsbury.—Short History of English Literature; Macmillan, 1898; \$1.50.
 Schofield.—English Literature from the Conquest to Chaucer; Macmillan, 1906; \$1.50.
 Simonds.—English Literature, Textbook of; Houghton, 1902; \$1.25.

XII. LITERATURE—SPECIAL WORKS.

- Beers.—History of English Romanticism in the Nineteenth Century; Holt, 1901; \$1.75.
 Crawshaw.—The Making of English Literature; Heath, 1907; \$1.25.
 Gosse.—History of Modern English Literature; Appleton, 1898; \$1.50.
 Hales.—Handbooks of English Literature; Macmillan; a series, each volume about \$1.
 Scudder.—Social Ideals in English Letters; Houghton, 1898; \$1.75.
 Tucker.—The Foreign Debt of English Literature; Macmillan, 1907; \$2.

XIII. NOVEL.

- Cross.—Development of the English Novel; Macmillan, 1899; \$1.50.
 Hamilton.—Materials and Methods of Fiction; Baker & Taylor, 1908; \$1.50.
 Horne.—The Technique of the Novel; Harper's, 1908; \$1.50.
 Perry.—The Study of Prose Fiction; Houghton, 1902; \$1.25.
 Raleigh.—The English Novel; Scribner's, 1894; \$1.25.
 Stoddard.—Evolution of the English Novel; Macmillan, 1900; \$1.50.
 Whitcomb.—The Study of the Novel; Heath, 1905; \$1.25.

XIV. PUNCTUATION.

- Bigelow.—Handbook of Punctuation; Lothrop, Lee & Shepard, 1893; 50 cents.
 Chase, T. N.—Punctuation and Paragraphing; T. N. Chase, 1909; 15 cents.
 De Vinne.—Correct Composition; Century Publishing Company, 1902; \$2.
 Perry.—Punctuation Primer; American Book Company, 1908; 30 cents.
 Ramsay.—Principles of Modern Punctuation; R. L. Ramsay, 1909; gratis.
 Teall.—Punctuation; Appleton, 1897; \$1.

XV. SHORT STORY.

- Albright.—The Short Story; Macmillan, 1907; 90 cents.
 Baldwin.—American Short Stories; McClurg, 1902; \$1.
 Canby.—Book of the Short Story; Appleton, 1904; \$1.10.
 Cody.—World's Greatest Short Stories; McClurg, 1902; \$1.
 Esenwein.—Writing the Short Story; Hinds, Noble and Eldredge, 1909; \$1.25.
 Mabie.—Stories New and Old, American and English; Macmillan, 1908; \$1.50.
 Matthews.—The Short Story; The American Book Company, 1907; \$1.
 Matthews.—The Philosophy of the Short Story; Longman's, 1901; 50 cents.
 Taylor.—Composition in Narration; Holt, 1910; 75 cents.

XVI. VERSE—HISTORIES, COLLECTIONS, AND SPECIAL WORKS.

- Bronson.—English Poems; University of Chicago Press, 1905-'10; 4 volumes, each \$1.50.
 Gummere.—Popular Ballad; Houghton, 1907; \$1.50.
 Manly.—English Poetry; 1170-1892; Ginn, 1907; \$1.50.
 Newcomer-Andrews.—Twelve Centuries of English Poetry and Prose; Scott, Foresman & Co., 1910; \$1.75.
 Page.—British Poets of the Nineteenth Century; Sanborn, 1904; \$2.
 Pancoast.—Standard English Poems; Holt, 1899; \$1.50.
 Saintsbury.—Historical Manual of English Prosody; Macmillan, 1910; \$1.60.
 Stedman.—Victorian Anthology; Houghton, 1895; \$1.75.
 Stedman.—Victorian Poets; Houghton, 1887; \$2.25.
 Symonds.—Romantic Movement in English Poetry; Dutton, 1909; \$2.50.
 Ward.—English Poets; Macmillan, latest edition; 4 vols., each \$1.

XVII. VERSE—STRUCTURE.

- Alden.—Specimens of English Verse; Holt, 1903; \$1.25.
 Alden.—Introduction to Poetry; Holt, 1909; \$1.25.
 Corson.—Primer of English Verse; Holt, 1892; \$1.25.
 Gunnere.—Handbook of Poetics; Ginn, 1885, \$1.
 Matthews.—A Study of Versification; Houghton, 1911; \$1.25.

 MATHEMATICS.

Two units required; two units elective.

It is possible that before many years the subjects now taught in our public schools as arithmetic, algebra and geometry will be combined into a unified course and taught as the single subject of mathematics. The end to be desired would seem to be not merely that arithmetic, algebra and geometry may be taught simultaneously, but that these different phases of mathematics may be brought together into a genuine synthesis. To what extent such a synthesis is possible remains to be seen. In Germany and France simultaneous instruction in algebra and geometry has long been the custom, and one does not need to make a very serious study

of their programs to discover how much farther advanced in mathematics are their pupils than are Americans in corresponding grades. One who has spent considerable time in personal inspection of French secondary schools recently wrote: "Throughout the mathematics course one is impressed with the intimate relations existing among the various subjects. Arithmetic is not carried to a certain point, there to give way to algebra, in its turn, perhaps, to be supplanted by geometry; but from the fifth form in one division and from the fourth form in the other, at least two subjects are run conjointly. Some of the difficulties of algebra are thus already discounted by the elementary notions of the unknown quantity that have previously been encountered in the arithmetic. Geometry is especially emphasized in its numerical aspect, and in division B the mechanical drawing is closely correlated with them all. The result is that the mathematics work appears as a single unified subject with several facets, rather than as so many discrete studies of the school curriculum." (Farrington, French Secondary Schools, N. Y. 1910, p. 271.)

This readjustment of the mathematical curriculum is being worked out in the United States, not as a mere imitation of what is being done abroad, but in accordance with our widely different educational ideals and conditions. Textbooks written from this point of view are beginning to appear, and it is to be hoped that in a few years a fairly good selection will be available.

In Kansas the adoption of the Brooks-Myers arithmetic was to some extent a movement in this direction. However, until high-school textbooks written from this point of view are safely past the experimental stage it seems best to arrange the high-school course in mathematics according to the following outline, which is in accord with the recommendations made some time ago by a committee of the Kansas Association of Mathematics Teachers.

I. ALGEBRA. *One Unit.*

One year of algebra, consisting of the following topics: Algebraic notations, negative numbers, addition and subtraction, signs of aggregation, equations and problems, multiplication and division, type forms in multiplication and the factoring of the results, fractions and fractional equations, simultaneous linear equations, graphs and loci, involution, square root of numbers with a few polynomials, simplification of surds, quadratic equations. In general it is well to use the equation as a basis for this year's work, and to give the student those parts of algebra essential for a working knowledge of the equation.

To spend much time in developing formal operations, for which the student sees no use, does not awaken interest, however much it may conform to the logic of the subject. If, in attempting to solve equations and problems involving equations, the student can be led to see a necessity for developing certain formal processes, such algebraic manipulations cease to be purposeless and become natural and desirable to whatever extent the need for them has been made apparent. The interest of the student and the processes through which his mind passes in acquiring a working knowledge of the subject are more to be considered than the logical development of the subject matter. It is true that the selection of the textbook determines largely the nature of the material to be used, but the teacher decides for himself the manner and order in which that material is taken up. Students take pleasure in learning that which will enable them to realize themselves in some kind of immediate accomplishment. Hence, while the solution of equations and problems is not the chief purpose in all of the study of elementary mathematics, it may well be given the greatest emphasis during this first year's work, on account of its interest-awakening power. If this be done it will be necessary to limit the extent to which formal operations are developed when first taken up, and to omit complicated forms and problems requiring difficult manipulations of symbols. Such omissions will allow time for a fairly adequate

treatment of the quadratic equation. That the theory of the general quadratic should be included in the first year's work seems highly desirable for two reasons: (1) Since one year of algebra is all that is required in many high schools, so that many students get no more than the one year, it is desirable to make that one year as complete as possible, keeping a distinct aim in view. (2) Much use can be made of the quadratic in the geometry which is recommended to be taken before the last half year's work in algebra.

II. PLANE GEOMETRY. *One Unit.*

The work should include the usual theorems and constructions of good textbooks, including the general properties of plane rectilinear figures, the circle and the measurement of angles, similar polygons, areas, regular polygons, and the measurement of the circle.

The solution of original exercises is of the utmost importance and should be emphasized from the beginning. They should include loci problems as well as algebraic and numerical applications.

For a syllabus of the most important theorems and many suggestions regarding the teaching of geometry the teacher should read the report of the Committee of Fifteen of the National Education Association, which has been published in pamphlet form and may be secured gratis upon application to the Commissioner of Education, Department of the Interior, Washington, D. C.

Every student should be provided with a protractor as well as a ruler and compasses, and problems of construction should be carefully and accurately drawn. The teacher can add to the interest of the work by seeing that pupils become acquainted with the history of some of the more important theorems. If possible, copies of some of the available histories of mathematics should be at hand and the class be made familiar with them by references and assigned readings.

It is probably wise to omit the theory of limits and incommensurables from this course.

III. SOLID GEOMETRY. *One-half Unit.*

The work in solid geometry should include the usual theorems and constructions of good textbooks, including the relations of planes and lines in space, the properties and measurements of prisms, pyramids, cylinders and cones, the sphere and the spherical triangle, the solution of numerous original exercises, including loci problems.

The algebraic statement of theorems and formulas should receive special attention. Insistence upon accurate drawings, the use of blocks and models, and the construction of cardboard models of as many as possible of the solids studied, will all be found useful.

IV. ALGEBRA BEYOND QUADRATICS. *One-half Unit.*

Schools which do not offer college algebra or trigonometry will find it profitable to place this half-year of algebra in the fourth year of the course, instead of the last half of the third year. The student will then be more mature and better able to do abstract thinking.

The work should begin with a rapid review of the first year's course, including much of the more difficult work previously omitted. The course should include graphs of quadratic functions, problems involving quadratic equations, equations in the quadratic form, simultaneous quadratics (solutions of simpler ones illustrated by graphs), arithmetical and geometrical progressions, binomial theorem for positive integral exponents, and logarithms.

Much emphasis should be laid upon the function and functional thinking.

Fourth-year Mathematics.

In high schools offering four years of mathematics it is recommended that the fourth year's work consist of plane trigonometry one-half year, and college algebra one-half year. If both are taught the trigonometry should precede the algebra.

PLANE TRIGONOMETRY. *One-half Unit.*

The work should include the definitions and relations of the six trigonometric functions as ratios, circular measurement of angles, solution of right triangles, proof of important formulæ, much practice in trigonometric transformations, use of logarithms, solution of oblique triangles, practical problems.

It should be made clear to the student that the use of logarithms is not a necessity but a convenience in the solution of trigonometrical problems. He should be led to see that the use of logarithms, by substituting addition and subtraction for multiplication and division, economizes both time and labor. Some problems, therefore, should be solved by use of the tables of natural functions before logarithms are introduced.

COLLEGE ALGEBRA. *One-half Unit.*

This course should include the following topics: Permutations and combinations, limited to simple cases; complex numbers, with graphic representation of sums and differences; determinants of the second, third and fourth orders, including the use of minors and the solution of linear equations; numerical equations of higher degree, and so much of the theory of equations, with graphic methods, as is necessary for their treatment, including Descartes' rules of signs and Horner's method, but not Sturm's functions or multiple roots.

PHYSICAL GEOGRAPHY.

One-half unit, elective.

The following outline includes only the most essential facts and principles of physical geography, which must be studied in the classroom and laboratory.

THE EARTH AS A GLOBE.

SHAPE OF EARTH.—How proved; probable causes of.

SIZE.—How measured.

ROTATION.—How proved; day and night; longitude and time; latitude.

REVOLUTION.—How proved; rate; path; direction.

SEASONS and their causes.

MAGNETISM.—Compass; variation in.

MAP PROJECTION explained.

THE LAND.

DISTRIBUTION.—Graphic representation of topography.

CHANGES IN LAND AREAS AND IN LAND FORMS.—Effects of (1) elevation and depression, (2) deposition of sediments, (3) shore erosion.

PLAINS.—Plains distinguished from the plateaus and mountains. Kinds of plains: classification based on genesis, on topography, on fertility, etc. Development of plains of different forms. Distribution of the great plains of the earth. The costal plain of the Atlantic and Gulf coasts. The plains of the eastern interior. The plains of the western interior. Effect of climate and rock structure on topography of plains. Alluvial plains: their formation and importance. Relation of life to different forms of plains.

PLATEAUS.—Relations to plains and to mountains. Stages in the history of a plateau; young plateaus, dissected plateaus, old plateaus, broken plateaus. Effect of climate, rock structure, etc., on topography of plateaus. Locations of the great plateaus. Life conditions on plateaus.

MOUNTAINS.—Classes: block mountains; folded mountains; domed mountains; mountains of circumdenudation. History of mountains. Effects of climate, rock structure, etc., on mountain topography. Life conditions in mountains.

VOLCANOES.—Distribution. Phenomena of eruptions. History of a volcano. Influence of volcanoes on topography and life.

RIVERS.—Life history of a river from birth to old age. The work of rivers. The topography of surfaces shaped by river erosion at different stages of valley development. Revived rivers. Drowned rivers and valleys. The great drainage basins of the United States.

LAKES.—The distribution of lakes, particularly in North America. The changes which they are undergoing. Their relations to rivers. Their effect on climate. Their relations to life in general. Salt lakes; their history. The origin of lake basins.

GLACIERS.—The nature of glacier ice. The distribution of glaciers. The conditions necessary for glaciers. Types of glaciers. The work of glaciers. Glaciated areas compared and contrasted with areas which have not been affected by ice; especially the glaciated and nonglaciated areas of North America.

THE ATMOSPHERE.

Composition and office of atmosphere. Instruments used in study of atmosphere.

TEMPERATURE.—Source of atmospheric heat, and variations of atmospheric temperatures. Isothermal charts of world, and of the United States, especially the January, July and annual charts, with special study of (1) isotherms of northern and southern hemispheres, (2) location of heat equator, (3) cold pole, (4) crowded isotherms, etc.

PRESSURE.—Measurement of pressure. Determination of altitudes by atmospheric pressure. Relation to temperature. Study of isobars on United States weather maps. Distribution of pressure in general, in midwinter (January), and in midsummer (July). Relation of pressure (isobars) and temperature (isotherms).

CIRCULATION OF ATMOSPHERE.—Winds; their causes; their classes; and their effects.

MOISTURE.—Sources. Conditions for precipitation. Forms of precipitation; rain and snow; dew and frost; distribution of rain and snow; principles governing. Relation of precipitation to life.

STORMS.—Cyclones of temperate and tropical latitudes. Paths and characters of storms of United States. Relation of storms to general weather conditions. Weather at different seasons; study and construction of weather maps. Relation of weather to climate. Relation of climate, weather, etc., to life and to human industries.

THE OCEAN.

FORM.—Divisions and general characteristics of the oceans, and of ocean basins. Depth, density and temperature of ocean waters. Characteristics of ocean floor; topography, material, etc. The life of the oceans.

MOVEMENT OF OCEAN WATERS.—Waves; cause and effect. Currents; causes and their proofs; important currents; effects of currents on climate, life, etc. Tides; character of motion; causes of tides; variation of tides, and their causes; bores; effect of tides on navigation, harbors, etc.

WORK OF OCEAN.—Erosion and deposition. Shore lines; the leading types, and their distribution. Influence of harbors and coast lines, now and in the past.

SUMMARY.—The outline given can but enumerate the larger topics to be covered, and in a way suggest the point of view desired. Each topic should be treated so as to show its causal relations to other topics. So far as possible, the effects of earth features on life (especially human life) conditions should be emphasized.

Throughout the work an effort should be made to develop the student's ability to use the data presented. The acquisition of the facts presented in the textbooks is in itself of relatively little value. The student should be taught to apply, out of doors and in the laboratory, the principles developed in the classroom. When he can do this, and when he can utilize and combine the data presented in the books in new ways and to new ends, one of the chief aims of the study has been accomplished.

The course should include:

a. The study of one of the leading secondary textbooks in physical geography, for the sake of essential principles, and of well-selected facts illustrating those principles.

b. Individual laboratory work should occupy from one-fourth to one-half of the time of the student in the classroom. Field trips should take the place of some of the laboratory work. The results of laboratory work should be carefully recorded in writing, and in many cases should be made the basis of classroom discussion. Similarly the field work should be made the basis of written reports or of subsequent classroom discussion, or both. In general the laboratory and the field should be made to afford illustrations of as many principles and phenomena as possible.

ELEMENTARY SCIENCE.

There is a growing recognition of the value of a study of elementary science, physical and biological, in the freshman year of the high school. This plan is strongly recommended by committees of science teachers, and is rapidly finding a place in the curriculum of the secondary schools throughout the country. Two arguments for its introduction are: First, that it affords a knowledge of the fundamental facts of science to the large body of pupils who do not complete the four-year course. Second, that it serves an admirable purpose as an introduction to the more thorough study of the sciences to those who do complete the course.

A most excellent text is *Introduction to General Science*, by Rowell, published by the Macmillan Company. Another text confined entirely to the study of the simpler phases of physics and chemistry is *First Science Book*, Higgins, by Ginn & Co.

PHYSIOLOGY.

To promote the physical welfare of the child is the principal aim in the teaching of school physiology. This includes a knowledge of conditions favorable to growth and conducive to health and bodily vigor. Hygiene and sanitation treat of these facts.

To teach the structure and functions of the body without hygiene and sanitation is to miss the highest value of the subject, whatever other values may be realized. On the other hand, to teach hygiene and sanitation without the elements of anatomy and physiology is to build on the sand, with no scientific basis. Let this foundation, then, be adequate to an intelligent understanding of hygiene, but do not give all of the time and effort of the class to laying the foundation.

Properly taught, physiology is one of the most practical of utilitarian subjects, in that it teaches people how to safeguard health, the most valuable economic asset they possess. Health means power to work with body and mind, economy in cost of living, longevity and enjoyment.

The true scientific spirit should pervade the teaching of school physi-

ology; it should be related to the everyday activities and conditions of life that affect health, and should be made concrete and personal. Moreover, the teaching of hygienic facts is not sufficient, for these facts must be transformed into hygienic actions, and hygienic actions into hygienic habits.

The following outline is, with some modifications, based upon Conn and Budington's *Advanced Physiology and Hygiene*. Hough and Sedgwick's *The Human Mechanism*, Ginn & Co., Chicago, has also been frequently consulted. The high-school library should contain the latest editions of Walter's *Physiology*, Fitz's *Physiology and Hygiene*, Martin's *Human Body*, Wilson's *The Cell in Development and Inheritance*, Davison's *Human Body and Health*, Bergey's *Principles of Hygiene*, Ritchie's *Primer of Sanitation*, and Hough and Sedgwick's *The Human Mechanism*, as reference books for pupils and teacher. Bulletins of the State Board of Health will be sent regularly on request to the secretary. The teacher's library should include Gray's *Anatomy* and Hall's *Textbook of Physiology, Normal and Pathological*, or similar new advanced textbooks.

Every student in physiology should keep a notebook embodying the essentials of this subject, including suggestive notes, outlines, diagrams, and records of demonstrations and experiments. Outlines in *Physiology*, by Prof. C. H. Nowlin, Kansas City, Mo., will be found helpful in this connection.

I. LIVING MATERIAL OF THE BODY.

(See Conn and Budington, ch. I.)

1. Definition of terms.
 - A. Physiology.
 - B. Human physiology.
 - C. Anatomy.
 - D. Histology.
 - E. Hygiene.
 - F. Organism.
 - G. Organ.
 - H. Function.
 - I. Tissue.
2. Cells: the units of work and of structure.
 - A. Kinds of cells.
 - B. Structure of cells.
 - C. Description of protoplasm.
 - D. Activities of cells.
 1. Growth and repair.
 2. Division.
 3. Motion.
3. Unicellular and multicellular animals.
 - A. Division of labor.
 - B. Supreme importance of cells in the work of the body.

II. NUTRIENTS OR FOODSTUFFS.

(Conn and Budington, ch. II, III; Hall, ch. V.)

1. Terms to be understood; chemical elements; chemical compounds; foods; nutrients; condiments; solutions; emulsions.
2. Foods classified. (See Martin's *Human Body*.)
 - A. Proteids: examples and uses.
 - B. Carbohydrates: examples and uses.
 - C. Fats: examples and uses.
 - D. Inorganic salts and water.
3. Food values.
 1. Tables. (See Bulletin Kansas State Board of Health, February, 1911.)

4. Food habits.
 - A. Study of rations.
 - B. Habits of eating.
 1. Overeating.
 2. Frequency of eating; appetite as a guide.
 3. Vegetarianism.
 4. Proper use of condiments.
5. Cooking.
 - A. Three reasons.
 - B. Best methods.
6. Beverages.
 - A. Water: why use plenty.
 - B. Value and danger of other drinks.
 - C. Alcohol: undesirable effects.

III. FERMENTATION AND GERM DISEASES.

(Conn and Budington, ch. IV; Hough and Sedgwick, ch. XXX.)

1. Kinds of ferments.
 - A. Organized: yeasts, bacteria.
 - B. Unorganized: ptyalin, pepsin, etc.
 - C. Points of similarity and difference.
2. Bacteria.
 - A. Description: size, multiplication, forms.
 - B. Where found.
 - C. Beneficial bacteria: many kinds.
 - D. Harmful (pathogenic) bacteria: few kinds.
3. Immunity.
 - A. Natural: all possess it to some extent.
 1. How increased or decreased.
 - B. Artificial. (See Bulletin State Board of Health, May, 1911.)
 1. Acquired by having disease, vaccination, etc.
4. Methods of killing bacteria discussed.
 - A. Sterilizing.
 - B. Disinfecting.
 - C. Pasteurizing.

IV. DIGESTION OF FOOD.

(Conn and Budington, ch. V, VI, VII, VIII.)

1. Object of digestion.
2. Salivary digestion, or digestion in the mouth.
 - A. Mechanism.
 1. The teeth: sets, kinds, parts, materials, decay.
 2. The tongue: structure and uses.
 3. The salivary glands: location and use.
 - B. Processes.
 1. Mastication: importance, Fletcherism.
 2. Secretion of saliva: how stimulated; quantity.
 3. Starch digestion: work of ptyalin; how long continued; how stopped.
 - C. Diseases of mouth and throat.
 1. Tonsillitis: symptoms, treatment.
 2. Diphtheria: distinguished from tonsillitis; antitoxin treatment (see Bulletin, March, 1910; also, special Bulletin State Board of Health); quarantine.
 3. Mumps: often serious; isolate patient.
 - D. Care of the teeth: keep clean; consult dentist.
3. Gastric digestion, or digestion in the stomach.
 - A. Mechanism: the stomach.
 1. Location, shape, capacity.
 2. Coats, openings, valves.
 3. Gastric glands.

3. Gastric digestion, or digestion in the stomach—*continued*.
 - B. Processes.
 1. Storage, peristalsis.
 2. Secretion of gastric juice influenced by appetite and psychic stimuli.
 3. Quantity and composition of gastric juice.
 4. Work of gastric juice.
 - a. Of hydrochloric acid.
 - b. Of pepsin.
 - c. Of rennin.
4. Intestinal digestion.
 - A. Mechanism: small intestine, large intestine, pancreas, liver.
 1. Location and structure of each.
 - B. Processes.
 1. Muscular movements: peristaltic.
 2. Secretion of intestinal juice: composition.
 3. Work of pancreatic juice: action of trypsin; of amylip-sin; of steapsin.
 4. Work of bile.
 5. Work of large intestine.
5. Absorption of food.
 - A. By blood vessels: through the liver.
 1. All sugar.
 2. Most peptone, salts, acids and water.
 - B. By lacteals.
 1. All oil products.
 2. Little peptone, salts, acids and water.
6. Diseases of the intestinal tract.
 - A. Summer complaint.
 1. Cause, treatment.
 - B. Appendicitis.
 1. Probable causes: taking cold, constipation, sedentary habits, infection, weak organ.
 2. Treatment.
 - C. Typhoid fever.
 1. Cause: typhoid bacilli.
 2. Germs found in water, milk, oysters.
 3. Flies carry the germs. (See Bulletin State Board of Health, April, 1911.)
 4. Prevention: care of food and drink supply; disinfect all that comes from the sick room.

V. THE BLOOD.

(Conn and Budington, ch. IX.)

1. Quantity of blood.
2. Composition.
 - A. Plasma: composition and use.
 - B. Red corpuscles: size, shape, color, origin, composition, use, fate.
 - C. White corpuscles: size, shape, color, origin, composition, movement, use, fate.
 - D. Platelets: size, shape, color, use.
3. Clotting: description, favorable conditions, purpose.
4. Diseases of the blood.
 - A. Blood-poisoning.
 1. Cause: pus-forming bacteria, usually in a wound.
 2. Prevention: disinfect all wounds; cover with disinfecting ointment and sterile bandage.
 - B. Malaria, ague.
 1. Cause: germs (protozoa) carried by mosquitoes.
 2. Prevention: protect sick person from mosquitoes; destroy breeding places of mosquitoes.

4. Diseases of the blood—*continued*.

C. Yellow fever.

1. Cause: germs carried by mosquitoes.
2. Prevention: same as for malaria.

VI. THE HEART AND BLOOD VESSELS.

(Conn and Budington, ch. X.)

1. The heart.

A. Location, size, shape, coverings.

B. Internal anatomy: auricles, ventricles, valves, septum.

C. Regulation.

1. Impulse to beat.
2. Inhibitory influences.
3. Acceleratory influences.

2. The arteries and veins: structure and functions.

3. The capillaries: structure and use.

VII. CIRCULATION OF BLOOD AND LYMPH.

(Conn and Budington, ch. XI.)

1. Causes of blood pressure.

2. Checking hemorrhages.

3. Regulation of the circulation.

4. Abnormal circulation.

A. Fainting: Cause and treatment.

B. Causes and results of "high pressure."

5. The Lymph.

A. Source: plasma of the blood.

B. Uses: nourish tissues and collect waste matter.

C. Disposal: returned to the blood.

6. Location, function and use of lymph nodes.

VIII. RESPIRATION.

(Conn and Budington, ch. XII, XIII.)

1. The respiratory organs.

A. The nose and pharynx: description.

1. Reasons for breathing through the nose.
2. Sense of smell: location and use.

B. The trachea and lungs: structure and use.

C. Diseases.

1. Colds: caused by bacteria; induced by exposure, improper ventilation, clothing, bathing, exercise.
2. Pneumonia.
 - a. Usually follows a cold.
 - b. Serious character: call physician.
3. Tuberculosis.
 - a. Cause: tubercle bacilli.
 - b. Varieties.
 - c. Means of checking tuberculosis. (See text, pp. 185 to 189, Bulletins State Board of Health.)
 - d. Treatment: pure air, nourishing food, exercise, sunshine.

2. Mechanism and chemistry of respiration.

A. Rib breathing and diaphragm breathing: need of large capacity.

B. Changes in the air during breathing: oxygen, carbon dioxide, temperature, moisture.

C. Breathing and exercise—"second wind."

2. Mechanism and chemistry of respiration—*continued*.

D. Ventilation.

1. Necessity.
2. Principles (six).
3. Systems of ventilation (Davison).
4. Rule: "ventilate."

E. Treatment in cases of suffocation and drowning (Davison).

F. The vocal organs: structure.

1. Discussion of pitch, quality and loudness.
2. Care of the voice.

IX. EXCRETION.

(Conn and Budington, ch. XIV, XV.)

1. Organs of excretion: list, with substances eliminated.

These substances are waste products separated from the blood, and therefore do not include indigestible portions of food expelled from the intestine.

2. Anatomy of the kidneys.

A. Number, size, location, shape.

B. Structure: shown by diagram and studied by specimen of pig's kidney.

3. Action of kidneys in excreting urine: filtration of water and salts, and cell-selection of urea.

4. Diseases.

A. Bright's disease.

1. Failure of kidneys to excrete urea.
2. Excretion of albumin.
3. Consult physician.

B. Diabetes.

1. Excretion of sugar by kidneys.
2. Faulty nutritive processes.
3. Diet, little carbohydrate.
4. Consult physician.

5. The skin.

A. Structure.

B. General functions.

C. Glands.

1. Sebaceous: location, description, work.
2. Sweat: location, description, work, regulation.

D. Hair and nails: care of each.

6. Regulation of body temperature: by lungs, skin, circulation and perspiration.

7. Care of the skin.

A. Bathing.

1. Need, frequency, kinds.
2. Rule: "bathe."

B. Clothing: quality and quantity for different seasons.

C. Burns.

1. Smother fire.
2. Cover burn with oil or vaseline.

D. Frostbites: warm slowly and keep cool.

E. Pimples, boils, carbuncles.

1. Treat antiseptically.
2. Do not pick with the fingers.
3. Protect with sterile covering.
4. Those subject to pimples should use medicated soap.

X. THE SKELETON: BONES, CARTILAGES, LIGAMENTS.

(Conn and Budington, ch. XVI.)

1. Skeletons the pupils have seen.
 - A. Outside skeletons.
 - B. Inside skeletons.
 - C. Mixed skeletons.

NOTE.—Every high school should be supplied with an articulated human skeleton. Pupils will bring a variety of bones to the class for comparison.

2. Functions of the skeleton.
3. Chemical composition of bone.
 - A. In children.
 - B. In adults.
4. Care of the bones.
 - A. Habits and nutrition of child.
 - B. Repair of broken bones.
5. Cartilage: structure and uses.
6. Joints.
 - A. Structure.
 - B. Classification.
 - C. Sprains and dislocations: prevent inflammation; give rest or little exercise.
7. Care of the feet: proper shoes to wear.

XI. MUSCLES AND TENDONS.

(Conn and Budington, ch. XVII; Hough and Sedgwick, ch. XVII.)

1. Muscles the pupils have seen: the various colors of muscles in fowls, fishes, quadrupeds.
2. Tendons: studied in class, using such material as the leg of a chicken.
3. Muscles classified as to—
 - A. Structure.
 - B. Form.
 - C. Location.
 - D. Nerve control.
4. Conditions affecting efficiency.
 - A. Temperature.
 - B. Fatigue.
 - C. Nutrition.
 - D. Training.
5. Effects of use and disuse.
6. Exercise.
 - A. Physiological effects (eight).
 - B. Characteristics of a good exercise (five).
 - C. Corrective exercises for—
 1. Round shoulders.
 2. Drooping neck.
 3. Lateral curvature of spine.
 4. Lack of development of other parts.
 - D. Hygienic value of corrective exercises.
 - E. Value of plays and games.
 - F. Athletics, use and abuse.
 - G. Exercises for nervous coördination.
7. Diseases of muscles.
 - A. Tetanus.
 1. Caused by tetanus bacillus: germ from the soil introduced into flesh.

7. Diseases of muscles—*continued*.

A. Tetanus.

2. Preventive measures.

a. Thoroughly disinfect the wound.

b. In case of unusual danger use antitoxin.

3. Treatment: administer antitoxin early, in large doses.
(See Bulletin Kansas State Board of Health, May, 1911.)

XII. THE NERVOUS SYSTEM.

(Conn and Budington, ch. XVIII.)

1. Terms to be understood: neuron, dendrite, axon, nerve fiber, nerve center, stimulus, reaction, motor, sensory, afferent, efferent, central, peripheral, reflex.
2. Central nervous system, consisting of—
 - A. Central organs: brain, cord, ganglia.
 - B. End organs: special sense organs and motor end plates in muscles.
3. Sympathetic nervous system, consisting of—
 - A. Ganglia.
 - B. Sympathetic nerves.
 - C. Plexures (about internal organs).
4. Structure of the brain and spinal cord.
5. Functions of the different parts.
 - A. Cerebrum.
 - B. Cerebellum.
 - C. Medulla.
 - D. Spinal cord.
6. The cranial nerves: general location and function.
7. The spinal nerves.
 - A. Classes, roots.
 - B. General function.
8. Reflex action.
 - A. Mechanism: reflex arc.
 - B. Advantages of reflex action, quick, correct, relief to brain.
 - C. Reflex action and habit.
9. Functions of the sympathetic system.
 - A. Control circulation.
 - B. Control secretion, excretion and digestion.
 - C. Harmonize action of various organs.
10. Care of the brain.
 - A. Need of exercise; kind and amount.
 - B. Rest and sleep necessary.
11. Diseases of the nervous system.
 - A. Idiocy: cause; training of feeble-minded.
 - B. Insanity.
 1. Causes: heredity, ill health, alcoholism, trouble, overwork, injury.
 2. Prevention: avoid causes, if possible.
 - C. Paralysis—cause: usually clot of blood.
 - D. Nervous prostration.
 1. Causes: continued mental strain, lack of exercise, improper nutrition.
 2. Treatment: complete rest and change of scene and occupation; proper exercise and diet.

XIII. STIMULANTS AND NARCOTICS.

(Conn and Budington, ch. XX; Hough and Sedgwick, ch. XX.)

1. Stimulants defined.
2. Tea, coffee, cocoa.
 - A. Active principle of each.
 - B. Best methods of preparing.
 - C. Benefits of use.
 - D. Dangers to the nervous, the dyspeptic, the young.
 - E. Dangers of the drug and patent-medicine habit.
3. Strychnine—caution: use only when prescribed by physician.
4. Narcotics defined.
5. Opiates: laudanum, paregoric, morphine, etc.; effects; habit.
6. Cocaine, choral: enslaving influence.
7. Alcoholic drinks classified: examples and strength.
8. Physiological action of alcohol.
 - A. False stimulation or exhilaration.
 - B. Inhibition of brain functions.
 - C. Alcohol and muscular work: experiments.
 - D. Alcohol and arteries: observations.
 - E. Alcohol and exposure to cold: danger.
9. Pathological conditions due to alcohol.
 - A. Acute.
 1. Mental.
 2. Bodily.
 - B. Chronic.
 1. Mental.
 2. Bodily: nervous system, heart, arteries, stomach, liver, kidneys.
10. Relation of intemperance to poverty; to crime; to insanity; to disease in general (Davison).
11. Tobacco.
 - A. A variety of effects.
 - B. Arguments against its use.
 - C. Our young men are being injured more by tobacco than by alcoholic drinks.

"Boys who use cigarettes seldom fail in later life; they have no later life."—DAVID STARR JORDAN.

XIV. ORGANS OF SPECIAL SENSE.

(Conn and Budington, ch. XXI, XXII.)

1. The eye.
 - A. Description, location and use of the principal parts.
 - B. Defects: their cause and remedy.
 1. Nearsightedness.
 2. Farsightedness.
 3. Astigmatism.
 4. Cataract.
 - C. Care of the eyes in regard to—
 1. Eye rest.
 2. Illumination of object.
 3. Flickering light.
 4. Glossy paper.
 5. Cleanliness.
 6. Removing foreign substances.
 - D. The expert oculist versus the "quack."
2. The ear.
 - A. Description and use of the outer, middle and inner ear.
 - B. Function of the semicircular canals.
 - C. Perception of pitch.
 - D. Deafness: causes and prevention.

XV. CONTROL OF PUBLIC HEALTH AND SANITATION.

(Conn and Budington, ch. XIII; Hough and Sedgwick, ch. XXVI to XXXV, inclusive.)

1. Factors determining public health.
 - A. Thickly settled communities.
 - B. Personal habits.
 - C. Climate.
 - D. Cleanliness of surroundings.
 - E. Mosquitoes, flies, fleas, rats.
 - F. Pet animals: cats and dogs.
2. Plan of campaign for public health.
 - A. Prevent spread of disease germs.
 1. By disinfecting.
 2. By quarantining.
 3. By care on the part of those who are sick.
 - B. Increasing individual resistance.
 1. By sanitary conditions of home and neighborhood.
 2. By instruction in hygienic living.
3. Preventable diseases: how spread and how prevented.
 - A. Tuberculosis.
 - B. Typhoid fever.
 - C. Diphtheria.
 - D. Scarlet fever, measles and whooping cough.
 - E. Smallpox.
4. The home.
 - A. Location: light and air.
 - B. The house.
 1. Furnishing.
 2. Cleaning: sweeping, dusting, vacuum cleaners.
 3. Rugs versus carpets.
 4. Sanitary cellar.
 5. Heating and ventilation.
 6. Lighting.
 - C. Water supply.
 1. Necessity for pure water.
 2. Location and construction of well (see Bulletin Kansas State Board of Health, January, 1911).
5. Sewage: systems of disposal.
6. Health officials.
 - A. Duties and authority.
 - B. Need of coöperation on part of public.

PHYSICS.

One unit.

Physics as a subject for high-school instruction has a double advantage. It is not only so intimately related to the pupils' daily lives that they already possess a large range of concrete experience on which to base their work, but it also is essentially a science of measurement, capable of training the pupils in quantitative thinking and in an appreciation of the value of definite, quantitative knowledge. It is both concrete and abstract, practical and theoretical. It therefore offers unlimited opportunities for training pupils in the methods of thinking by which all real knowledge is obtained; and, conversely, for giving them greater control of their physical environment by teaching them how to apply the knowledge thus acquired to the world of practical affairs in which they must live.

In order that physics may realize the two distinctive ends just mentioned, it is essential that the pupils gain clear ideas of the meanings of

the terms used as well as of the laws and principles developed. But the clearness with which a given idea or principle is grasped is usually proportional to the number of familiar experiences which are associated with that idea or principle; and, conversely, the association of a large number of familiar experiences with an idea or a principle renders the application of that idea or principle to daily experiences much easier and more certain. Therefore, in teaching a physical principle, it is not sufficient to introduce it and demonstrate it with a piece of unfamiliar apparatus on the lecture table or in the laboratory.

Successful teaching of physics requires both class work and laboratory work. These two kinds of work must supplement each other, and the topics treated should be as far as is possible the same in both. Without the actual performing of experiments in class and laboratory, the textbook is almost meaningless and is soon forgotten. It is generally better to introduce a topic by means of informal discussion with the class concerning familiar experiences. For example, if the topic is specific gravity, the knowledge already in the possession of the class should first be called forth by means of questions concerning their experiences with floating and sinking of such familiar things as their own bodies, chips, corks, logs, cream, ice, stones, nails, lead keels, fishing sinkers, etc. When the principle or idea under discussion has been brought out by such discussion it should be defined or demonstrated by one or more experiments, and then fixed by requiring the solution of a number of simple, real concrete problems. If the class work has been skillfully conducted a number of problems or disputes will have arisen of a sort that can be settled only by making experiments and measurements.

The laboratory is the place in which to settle such problems and disputes. In the ideal case the results of each laboratory experiment will solve some problem or settle some dispute; and the more concrete and significant the problem or the dispute, the greater the value of the work. For example, the pupils will probably get much more valuable training from the laboratory work in specific gravity if they be shown first a rectangular block of oak and asked who can predict how high it will float out of water, than if the experiment is presented in the usual way, namely: "Find the specific gravity of a rectangular solid body lighter than water." In the first case a problem is presented, measurement is required for its solution, and the competitive sense is appealed to; in the second case there is no problem that has any significance to the pupils.

When the laboratory is used as a court of appeal where disputed points can be settled, the work there helps to fix in mind and to clarify principles, besides giving discipline in scientific thinking; but when it is used merely to determine the specific gravity of a body heavier than water, or that of a body lighter than water with a sinker, or of a liquid with a pycnometer, or of a liquid by Hare's method, etc., the work tends to give training in little besides the technique of the physicist. The work of the high school is to educate boys and girls, not to train research physicists.

Since the laboratory is the place to solve problems that can not be solved without experiment and measurement, the most fruitful type of experiment is the one whose result is not known in advance. The attempt to determine physical constants whose values are known with far greater accuracy than it is possible to hope for in an elementary laboratory is, to say the least, discouraging. Thus, the theoretical mechanical advantage of an inclined plane or of a set of pulleys is known in advance; but the actual efficiency of a given plane or pulley is not known, but depends on how the machines are handled. If the student is asked: What is the greatest efficiency of this inclined plane? is it greater with large load or with small load? he will probably get far more real training from his work than he will if asked to "verify the law of the inclined plane." In the former case he has a problem to solve, and the solution depends on what he is able to make the plane do; in the latter case he has to make his results tally with the theory.

Other similar problems that lead to significant and valuable laboratory work are: What is the maximum efficiency of a small water motor? Which kind of gas burner is most efficient on cookstoves? Which boy's electric motor is most efficient? How much more efficient is a tungsten lamp than a carbon lamp? What kind of a lens shall I get for a camera for making pictures for lantern slides?

Probably the most difficult task that confronts the physics teacher in the small high school is to start the equipment of a laboratory on small means. The first maxim is, buy for use and not for show. Buy the less expensive first. Get the necessities before the luxuries. Do not begin by the purchase of Geisler tubes and X-ray apparatus. Also, do not forget that the members of the class probably possess boats, motors, engines, telegraph outfits and many other similar things which they are not only willing but eager to bring to class and explain. The local industries, shops and factories also offer rich opportunity for making the work vital and significant.

In offering suggestions in regard to the equipment of a laboratory let us begin with the room itself. This should be dry, well lighted, and, if possible, with south exposure. The room should be provided with heavy, flat-topped tables, about thirty-two inches high. The length and breadth of these must often be adapted to the shape of the room; but, when possible, tables three feet wide and eight feet long will be found very convenient. These tables should have no iron in their construction, and the top should project at least three inches. Any good carpenter can make these tables.

If there is a good water system in the building, the laboratory should be provided with a sink. If not, a wooden tank a foot deep, two feet wide and three feet long, lined with lead or galvanized iron, will be found convenient. If the laboratory can be supplied with gas, the fixtures should hang from the ceiling directly over the tables and about four feet above them. Connections can then be made with Bunsen burners by the use of rubber tubing. If no gas can be provided, gasoline torches handled with care are the best substitute.

Cases for storing apparatus should be about fourteen inches deep, with movable shelves and glass fronts. They should be self-locking and all open with the same key. It is to be noted that hard-rubber apparatus should be stored in a dark place. A class in physics consumes, at best, more of the teacher's time than one in most other branches. Everything about the laboratory should be arranged to facilitate the getting out and putting away of apparatus. Then the teacher should be expected and required to see that all tools and apparatus are locked up when not in use.

A few tools for making and repairing apparatus are an essential part of a laboratory equipment. There should be at least a small carpenter's workbench, and at least the following tools: Vise, fine-toothed saw, small plane, brace, drills, screw drivers, pliers, files, small claw hammer, tin-ner's snips, small soldering iron, hack saw.

Experience has taught us that the average teacher of physics is liable to err in requiring the class to study too many topics and do too many experiments. The result of such an error is that the pupil becomes confused and also acquires careless habits in the use of apparatus and the making of measurements. He is apt to get the habit of being satisfied with hurried and slovenly work. It would be far better for the teacher to select half the number of experiments, and to see to it that each member of the class performs each experiment individually, and preserves a description of his work and its results in neat, orderly, readable form.

The following list of topics was prepared by a committee of physics teachers of the North Central Association of Colleges and Secondary Schools. It contains the topics which all teachers agree are desirable for a first course in physics. A pupil who has learned these topics well has done a good year's work in physics. It is, however, possible to increase the number of topics without leading to superficial work. The topics with

stars opposite them are the ones best adapted to furnish laboratory problems.

- *1. Weight, center of gravity.
- *2. Density.
- *3. Parallelogram of forces.
4. Atmospheric pressure; barometer.
- *5. Boyle's law.
6. Pressure due to gravity in liquids with a free surface; varying depth, density, and shape of vessel.
- *7. Buoyancy; Archimedes' principle.
- *8. Pascal's law; hydraulic press.
9. Work as force times distance, and its measurement in foot-pounds and gram-centimeters.
10. Energy measured by work.
- *11. Law of machines; work obtained not greater than work put in; efficiency.
- *12. Inclined plane.
- *13. Pulleys, wheel and axle.
- *14. Measurement of moments by the product of force times arm; levers.
15. Thermometers; Fahrenheit and Centigrade scales.
16. Heat quantity and its measurement in gram calories.
- *17. Specific heat.
- *18. Evaporation; heat of vaporization of water.
- *19. Dew point; clouds and rain.
- *20. Fusion and solidification; heat of fusion.
21. Heat transference by conduction and convection.
22. Heat transference by radiation.
23. Qualitative description of the transfer of energy by waves.
24. Wave length and period of waves.
25. Sound originates at a vibrating body and is transmitted by waves in air.
- *26. Pitch and period of sound.
- *27. Relation between the wave length of a tone and the length of a string or organ pipe.
- *28. Resonance.
29. Beats.
30. Rectilinear propagation of light; pin-hole camera.
- *31. Reflection and its laws; image in a plane mirror.
- *32. Refraction, and its use in lenses; the eye, the camera.
- *33. Prisms and dispersion.
34. Velocity of light.
35. Magnetic attractions and repulsions.
- *36. Field of force about a magnet.
37. The earth a magnet; compass.
38. Electricity by friction.
39. Conductors and insulators.
- *40. Simple galvanic cell.
- *41. Electrolysis; definition of the ampere.
- *42. Heating effects; resistance; definition of the ohm.
- *43. Ohm's law; definition of the volt.
- *44. Magnetic field about a current; electromagnets.
- *45. Electromagnetic induction.
- *46. Simple alternating-current dynamo of one loop.
- *47. Electromagnetic induction by breaking a circuit; primary and secondary.
48. Conservation of energy.

The following laboratory problems are suggested as suitable ones to accompany the topics in the syllabus. Each student should do at least thirty experiments of this type.

1. How find the center of gravity of an irregularly shaped piece of

cardboard or sheet metal? How prove that the point found is the center of gravity?

Irregularly shaped card or sheet metal; plumb line.

2. Which requires the stronger foundation, a brick wall or a concrete wall of the same dimensions?

Brick; block of concrete; spring balance; meter stick.

Which weighs most, a wooden bridge containing 500 cubic feet of spruce, or an iron bridge containing 100 cubic feet of iron?

Block of spruce; block of iron; spring balance, meter stick.

3. What is the tension on a tie rod that supports an electric arc lamp that weighs 70 pounds?

Spring balance; wooden stick; string; weights.

4. A colt can pull half as hard as a horse. How arrange a whiffletree so that the two can be hitched to a wagon and each get his share of the load?

Two spring balances; meter stick; string.

5. Do gas meters measure gas at the pressure of the atmosphere, or at the pressure of the gas in the mains? Which method would give the consumer the most gas for his money? How much more?

Water manometer to measure gas pressure. Boyle's-law tube to measure change in volume with change in pressure. Two large iron pails to measure gas. School gas meter.

6. Given the diameter of the gasometer of the local gas works, measure the gas pressure and compute the weight of the iron top of the gasometer. What difference in level in the water level inside and out of the gasometer?

Construct model and verify conclusions. Compute volume of water displaced and get weight of gasometer top and confined gas.

7. How many cubic feet of pine are required to float a 100-pound boy entirely out of water?

Block of pine; meter stick; spring balance.

8. Five cubic feet of lead are used in the keel of a boat. How much does the lead weigh out of water? How much does it weigh under water? Would it sink the boat as far when it is fastened to the keel under water as it would when placed in the boat?

Chunk of lead; spring balance; jar of water.

9. Does it take more work to slide a cake of ice up an inclined plane than to lift it vertically to the top of the plane? If so, how much more? What is the maximum efficiency of the inclined plane in the laboratory?

Inclined plane; glass plate to cover its top; car; spring balance or set of weights.

10. Is more work required to pull a safe up to the third floor with a set of pulleys than to carry it up by hand? What is the maximum efficiency of the pulleys in the laboratory?

Pulleys; load to represent the safe; spring balance or set of weights.

11. Repeat 10, using the wheel and axle.

12. Does it require more work to lift a stone with a crowbar or to raise it directly by hand through the same height?

Lever; spring balances or set of weights.

Is the efficiency of the lever ever greater than 1? If so, why?

13. How much ice is needed to cool a gallon of water at 30 degrees C. to 2 degrees C.?

Calorimeter; ice; thermometer.

14. How much ice is melted in a refrigerator when an aluminum kettle at a temperature of 30 degrees C. and which weighs 1 pound is placed in the refrigerator and cooled to 2 degrees C.?

Aluminum chips; calorimeter; thermometer.

15. Which gas burner is most efficient?

Bunsen burner; gas-stove burner; kettle of water; thermometer.

Time rise in temperature of given amount of water. Note gas consumption on meter, or use Thorpe gauge.

16. On a given burner, which kettle is most efficient?

Several kettles; thermometer.

Note time required to heat given amount of water a given number of degrees.

17. In an open kettle of water that takes 15 minutes to come to a boil, how much water will boil away if the kettle boils for five minutes?

Try it and compute the heat of vaporization, or measure the latter and compute it, testing the conclusion.

18. What is the temperature at which dew forms to-day?

Dew-point hygrometer.

19. Which makes the best lining for a fireless cooker, an air space, felt, excelsior, mineral wool, etc.? Are any of them as good as a thermos bottle?

Thermometer and materials to make different cookers.

20. How is the siren whistle constructed, and why does it produce the peculiar effect?

21. How long are the waves of sound from your own voice?

Tune voice to organ pipe or other air column.

22. Can you make a photograph without a lens?

Pin-hole camera.

23. Why is the image in a plane mirror reversed?

Make a diagram by sighting images of pins.

24. What makes the "cow's hoof" in the bottom of a glass of water when it is placed below and to one side of a candle?

25. How do luxifer prisms or holophane shades send light into dark corners and help light up dark rooms? Why is there no color in the light transmitted by them?

Trace light through a prism.

26. Do different sized cameras when pointed from a given place at the same object all give images of the same size? Is there any relation between the size of the image and the distance from the center of the lens to the ground glass?

Several lenses of different focal lengths; meter stick.

27. At a given distance from a compass needle, in what position does a magnet produce the greatest deflection?

Trace lines of force about the magnet with the compass needle.

28. Which form of voltaic cell is best for door-bells? Which for telegraph lines? Which for toy motors?

Test them and find out why.

29. Why is it better to connect house electric lamps in parallel?

Try them both in series and parallel. Measure with voltmeter and ammeter.

30. Which radiates more heat per watt-hour, a carbon lamp or a tungsten lamp?

Voltmeter; ammeter; photometer.

31. Which furnishes the most light per watt-hour, a carbon lamp or a tungsten lamp?

Voltmeter; ammeter; photometer.

32. What makes the motor move?

St. Louis motor.

33. What is the efficiency of a small motor?

Voltmeter; ammeter; motor; brake.

34. What is the efficiency of the dynamo in the school or town?

35. What is the efficiency of a small water motor?

36. Which kind of coal for sale in your town gives the greatest number

of heat units per pound? Which gives the greatest number of heat units per dollar?

37. Is the heat equivalent of the city gas up to standard?

38. What is the most efficient steam engine in town? (Express result in pounds coal per h. p. h.)

39. Does the ventilating plant in your school supply the requisite amount of fresh air (3000 cubic feet per person per hour)?

40. How much coal is burned per day at your school? How much of the heat gets used up in heating the air? How much of it is lost up the chimney? Could the heating plant be improved? How?

APPARATUS.

The apparatus necessary for these problems is specified in the following list. Whether more than one set of apparatus should be provided depends on the size of the class and the resources of the school. By working in rotation in groups of two, all the members of the class, if it is not too large, may use one set of apparatus. This is especially true of the more expensive pieces.

For convenience in ordering, the numbers are given as found in the descriptive catalogue of C. H. Stoelting & Co., of Chicago. If these numbers are used for identification, orders can be filled by the following or by any other dealer: C. H. Stoelting, Chicago; Central Scientific Co., Chicago; Chicago Apparatus Co., Chicago; Bausch & Lomb, Rochester, N. Y.; William Gaertner & Co., Chicago; L. E. Knott Apparatus Co., Boston; W. M. Welch Manufacturing Co., Chicago.

The figures at the beginning of each paragraph refer to the experiment number; the figures in parenthesis indicate the catalogue number.

1 and 2.—(249) Harvard trip balance. (420) Brass weights in a block, 500 grams to 1 gram. (964) Aluminum cylinder, 40 mm. by 18½ mm.

3.—(309) Three spring balances, 250 grams and 8 oz.

5.—(1161) Boyle's-law glass tube, short end sealed.

8.—(946) Hydraulic press, glass model.

11.—Pine board 4 feet long.

12.—(685) Hall's carriage, metal, cone bearings. (713) Brass pulley with metal stem.

13.—(697) Wheel and axle, mounted on frame, iron.

14.—(74) Meter and yard stick combined, brass tipped.

17.—(1329) Copper boiler, detached tripod. Boiler has water gauge, copper dipper, screw cover and thermometer tube.

18.—(1335) Chemical thermometer, 12 in., 10° to 110° C. Colorimeter, thick brass, nickel plated, polished, 3 x 5¼ inches, 600 cs. capacity.

28.—(1703) Tuning fork, steel, C¹, 256 vibrations, 7¼ inches. Tuning fork, steel, C², 512 vibrations, 5⅞ inches. Glass tube, 110 cm. by 4 cm., ends annealed, stopper.

31.—Piece thin glass, one side painted black.

32.—Lens mounted, metal frame, wooden handle, double convex, 12 cm. focus.

33.—Equilateral prism.

36.—(1806) Bar magnets, pair, 6-inch box, with keepers. Two horseshoe magnets, U shape, 5½ inches long, 2 inches between poles.

40.—Students' demonstration battery, including glass tumbler, copper and zinc elements.

41.—Use above with two Columbia dry cells.

43.—Two galvanometers, frame, wood, 3 windings. Two compasses for above, 2-inch brass case, agate cap needle, aluminum pointer. Wheatstone bridge, brass strip meter stick on wood base.

44.—Wrought-iron nails and two Columbia dry cells.

45.—Same as 47.

46.—Two horseshoe magnets, copper wire.

47.—Two coils insulated copper wire, 500 turns, and a dry cell.

CHEMISTRY.

One unit.

Chemistry as an educational subject is equal to any other taught in the high school, if properly taught. It is not a lot of formulas and facts arranged to be committed to memory, but it is a long list of truths which can be discovered by *the pupil* by experiment and observation, and then these isolated truths can be generalized and the general knowledge applied to the world beyond the schoolroom.

The laboratory work and the study of the textbook are not independent subjects. They should be so correlated that each will help the other.

The work outlined requires a little more than two double laboratory periods per week and three recitations.

RECITATION WORK.

The application of an outline like the following to the common elements and some of their compounds makes a course which can be applied in the classroom. Apply the outline to all the topics in Roman numerals where it is applicable, emphasizing general principles and their application.

OUTLINE.

- I. Meaning of the name.
- II. History of its discovery.
- III. Occurrence.
 1. Free in nature.
 2. Compounds found in nature.
- IV. Methods of making in the laboratory.
 1. How made.
 2. How collected.
 3. How purified.
 4. The reactions.
- V. Physical properties.
 1. Form.
 2. Allotropic forms.
 3. Color.
 4. Diffusibility.
 5. Odor.
 6. Density.
 7. Solubility in water.
 8. Weight of one liter.
 9. Melting point.
 10. Boiling point.
 11. Conditions under which it may be changed to other forms.
- VI. Chemical Properties.
 1. Active or inactive.
 2. Compounds formed in the laboratory.
 3. Combustibility.
 4. Ability to support combustion.
 5. Action on water.
- VII. Test by which it is recognized.
- VIII. Commercial uses.
- IX. Problems.

It is best to follow the text in teaching, but in each chapter some new law or general principle should be developed and applied to the subsequent work. The subtopics suggest something of this kind for each subject discussed.

I. Introduction.

1. The metric system.
 - a. The unit of length, of capacity, of weight; their relations, and the standards of each.
2. Thermometers.
 - a. Fahrenheit and Centigrade, relation.
3. Relation of chemistry and physics.
 - a. Physical change.
 - b. Chemical change.
 - c. Mechanical mixture.
 - d. Chemical compound.
 - e. Things that cause chemical action.
4. The elements.
 - a. Distinguish from compounds.
 - b. Relative importance of twenty.
 - c. Symbols.
 - d. Reagents and reactions.
5. Importance of the study of chemistry.
 - a. To make exact thinkers.
 - b. To assist in the study of other subjects.
 - c. To develop the power to do things.
 - d. The commercial side.
6. The laboratory apparatus for the individual pupil.
 - a. Names of articles.
 - b. Uses.
 - c. Care.
7. The laboratory in general.
 - a. Care of apparatus for class use.
 - b. Cleanliness of tables, floor, sinks, hoods, etc.
 - c. Methods of distributing chemicals.
 - d. How to handle chemicals.

II. Hydrogen.

1. Forms of matter.
2. Physical properties of gasses.
3. Density and specific gravity of solids, liquids and gases.

III. Oxygen.

1. Oxides and oxidation.
2. Respiration.

IV. Water.

1. Physical properties of liquids.
2. Analysis and synthesis illustrated.
3. Solubility of salts.
4. Other solvents and the common use of each.
 - a. Ethyl alcohol.
 - b. Methyl alcohol.
 - c. Glycerine.
 - d. Chloroform.
 - e. Ether.
 - f. Carbon tetrachloride.
 - g. Benzene.
 - h. Carbon disulphide.
 - i. Turpentine.
 - j. Soap.
5. To be understood.
 - a. Distillation.
 - b. Filtration.
 - c. Deliquescence.
 - d. Efflorescence.
 - e. Hygroscopic.
 - f. Dehydrating.

IV. Water—*continued*.

5. To be understood.
 - g. Crystallization.
 - h. Saturation.
 - i. Precipitation.
 - j. Effervescence.

V. Chlorine.

1. The chlorides in nature.
2. Commercial uses.

VI. Hydrochloric acid.

1. General method of making an acid.

VII. Acids, bases, and salts.

1. Name twenty inorganic acids by applying the following principles:
 - a. Acids are named from the second element, the first always being hydrogen.
 - b. If an acid contains no oxygen, the name begins with "hydro" and ends in "ic."
 - c. The names of common acids that contain oxygen also end in "ic."
 - d. If an acid contains the same other elements in the same proportions and one less oxygen than the common acid, the name ends in "ous."
 - e. If an acid contains the same other elements in the same proportions and one less oxygen than the "ous" acid, the prefix "hypo" is added, and the name also ends in "ous."
2. Name twenty hydroxides by learning the number of hydrogens each metal replaces.
 - a. A hydroxide may be considered as water, HOH, with one hydrogen replaced by a metal; then the number of OH groups in a hydroxide is equal to the number of hydrogens replaced by the metal. Thus: HOH, KOH; 2HOH, Ca(OH)₂, 3HOH, Al(OH)₃; K replacing one H, Ca two, and Al three.
3. After studying the above and the following principles, the pupil should be able to give the composition and names of more than five hundred salts.
 - a. The names of salts end in "ide," "ite" or "ate," as sodium chloride, sodium chlorite, and sodium chlorate.
 - b. Salts derived from acids whose names begin with the prefix "hydro" have their names ending in "ide," as NaCl, sodium chloride.
 - c. Acids whose names end in "ous" form salts with names ending in "ite," as NaClO₂, sodium chlorite.
 - d. Acids that contain oxygen and have names ending in "ic" form salts whose names end in "ate," as NaClO₃, sodium chlorate.

If the name of an acid has a prefix, except "hydro," this prefix is part of the name of the salt also.

If the same elements unite in different proportions to form two salts or two hydroxides, to the metal of the one which unites with the most acid radical or the most hydroxyl "ic" is added when naming it, and to the other having the least acid

- VII. Acids, bases, and salts—*continued*.
 radical or hydroxyl "ous" is added: FeCl_3 , ferric chloride, and $\text{Fe}(\text{OH})_3$, ferric hydroxide; FeCl_2 , ferrous chloride, and $\text{Fe}(\text{OH})_2$, ferrous hydroxide.
 4. Neutralization.
 5. Indicators.
- VIII. Nitrogen and the atmosphere.
 1. The gas laws and their application.
 2. Ventilation of buildings.
- IX. Ammonia.
 1. Liquefaction of gases.
 2. Heat of vaporization.
 3. Manufacture of artificial ice.
- X. Nitric acid.
 1. Its action on metals.
- XI. Nitrogen oxides.
 1. Anhydrides.
- XII. Nitrates.
 1. Fertilizers.
 2. Leguminous plants.
 3. Root tubercles.
 4. Explosives.
- XIII. Sulphur.
 1. Allotropisms.
 2. Uses.
- XIV. Hydrogen sulphide.
 1. Uses as a laboratory reagent.
- XV. Sulphuric acid.
 1. Methods of making.
 2. Uses.
- XVI. Sulphur dioxide.
 1. Disinfectants.
 2. Aseptic, antiseptic.
 3. Sterilize.
 4. Drinking cups, etc.
- XVII. Carbon.
 1. Many forms and uses.
- XVIII. Carbon dioxide.
 1. Alcoholic fermentation.
 a. Bread making.
 2. Baking powders.
 a. Kinds and methods of making.
- XIX. Carbonates.
 1. Soluble and insoluble carbonates.
- XX. Carbon monoxide.
 1. Danger when breathed.
- XXI. Methane, acetylene.
 1. Under what condition are they explosive?
- XXII. Illuminating gases.
 1. Methods of making.
- XXIII. Bromine.
 1. A liquid element.
- XXIV. Iodine.
 1. Solubility in alcohol and uses of the solution.
 2. Sublimation.
- XXV. Fluorine.
 1. Uses of hydrofluoric acid.

- XXVI. Phosphorus.
 - 1. Matches, how made?
 - 2. Danger from poison.
 - 3. Uses of phosphates.
- XXVII. Arsenic.
 - 1. Marsh's test.
- XXVIII. Antimony.
 - 1. Peculiar physical property.
- XXIX. Bismuth.
 - 1. Hydrolysis.
- XXX. Silicon and boron.
 - 1. Sand.
 - 2. Kaolin.
 - 3. Glass.
 - 4. Borax.
- XXXI. Sodium.
 - 1. Dissociation (ionization).
 - 2. Ions.
 - 3. Sodium hydroxide.
 - 4. Soap.
 - 5. Soda.
- XXXII. Potassium.
 - 1. Potassium chlorate.
 - 2. Saltpeter.
- XXXIII. Ammonium.
 - 1. Salts formed by ammonium.
- XXXIV. Calcium.
 - 1. Lime, plaster, cement, gypsum, phosphorite and apatite.
 - 2. Bleaching powder.
- XXXV. Barium and strontium.
 - 1. Manufacture and uses of hydrogen peroxide.
- XXXVI. Magnesium.
 - 1. The flashlight.

The remainder of the time should be devoted to applying the knowledge of chemistry already gained to such topics as the following:

- XXXVII. Foods.
 - 1. Outlined according to their chemical composition.
 - 2. The source of each class.
 - 3. Food values and how determined.
 - 4. Bread, chemistry of making.
 - 5. Milk, composition, etc.
 - 6. Amount of water contained in different kinds.
 - 7. Chemical changes in cooking.
- XXXVIII. Beverages.
 - 1. Nonalcoholic.
 - a. Names.
 - b. Constituents.
 - c. Food values.
 - d. Methods of preparation.
 - 2. Alcoholic.
 - a. Names.
 - b. How made.
 - c. Per cent of alcohol.
- XXXIX. Food accessories.
 - 1. Vinegar, chemical process of making.
 - 2. Spices and flavors.
- XL. Methods of preserving foods.

- XLI. Food adulterations.
- XLII. Drinking water.
 - 1. Purification.
 - 2. Source.
 - 3. Dangers.
- XLIII. Sanitation of homes.
 - 1. Flies.
 - 2. Mosquitoes.
 - 3. Source of diseases.
- XLIV. Soils.
 - 1. Elements necessary for plant growth.
 - 2. In what salts.
 - 3. Source.
- XLV. Paints and paint pigments.
 - 1. Source of oil.
 - 2. Composition of colors.
- XLVI. Coloring and colors.
 - 1. Source and composition.
 - 2. Mordants.
- XLVII. Cleaning agents and washing powders.
 - 1. Composition.
- XLVIII. Give composition and names of fifty common substances.

BOOKS FOR REFERENCE.

Outlines of Industrial Chemistry.—Thorp.
 Sanitary and Applied Chemistry.—Bailey.
 First Principles of Chemistry.—Brownlee, Fuller, Hancock, Sohn and Whitsit.
 Essentials of Chemistry.—Hessler-Smith.
 Household Chemistry.—Vulte and Goodell.
 Chemistry in Daily Life.—Lassar-Cohn.

LABORATORY WORK.

NOTE.—Figures at beginning of each paragraph refer to experiment numbers.

- 1. Preliminary tests.
- 2. To show the forms of matter, solid, liquid, gas.
- 3. Causes of chemical change.
- 4. Difference between mechanical mixtures and chemical compounds.
- 5. General methods of making hydrogen, illustrated.
- 6. To prepare hydrogen and study its properties.
- 7. To demonstrate the law of constant proportions.
- 8. Methods of obtaining oxygen.
- 9. To prepare oxygen and study its properties.
- 10. To show that the oxygen of the air unites with some metals.
- 11. To make a synthesis of water.
- 12. Water of crystallization.
- 13. To soften water.
- 14. To purify water.
- 15. Efflorescence.
- 16. Deliquescence.
- 17. Distilled water as a solvent.
- 18. To prepare chlorine and study its properties.
- 19. Chlorine made from bleaching powder.
- 20. To make and separate potassium chlorate and potassium chloride.
- 21. To make hydrochloric acid and study its properties.
- 22. To make salts by neutralizing bases with acids.
- 23. To make pure nitrogen and study its properties.
- 24. The gas laws.

25. To prepare impure nitrogen from the air.
26. To make limewater and test for carbon dioxide.
27. To make ammonia and study its properties.
28. To make nitric acid and study its properties.
29. To make a nitrite from a nitrate and to distinguish them.
30. The nitrogen oxygen compounds.
31. To show allotropic forms of sulphur.
32. The preparation, properties and uses of hydrogen sulphide.
33. To make sulphur dioxide and study its properties.
34. Allotropic forms of carbon.
35. Carbon as a reducing agent.
36. Preparation and properties of carbon dioxide.
37. To make carbon monoxide and test its properties.
38. Properties of methane, natural gas.
39. To show that a gas has a kindling temperature.
40. The structure of a flame.
41. To prepare bromine and study its properties.
42. To prepare iodine and study its properties.
43. To make hydrofluoric acid and etch glass.
44. To make and test hydrogen peroxide.
45. Phosphorus and phosphoric acid.
46. Arsenic and some of its compounds.
47. Antimony and some of its compounds.
48. The properties of bismuth, hydrolysis.
49. Borax, the borax bead, boric acid.
50. To show that some salts break up into ions when in solution.
51. Sodium and some of its salts.
52. To make soap.
53. Potassium and its salts.
54. The alkaline earth metals, calcium, strontium, Barium and magnesium.
55. Tests for albumin.
56. Determination of per cent of water in a piece of bread.
57. Determine per cent of butter fat and other total solids in several samples of milk.
58. Test tea for tannin.
59. Make alcohol by fermentation.
60. Test samples of vinegar for per cent of acetic acid.
61. Preserve milk with formaldehyde and test for it.
62. Test weight and measure of some products bought at the grocery stores.
63. Count the number of bacteria in the drinking water used.
64. Show the presence of calcium, iron, sodium, carbon, silica, water, etc., in soils.
65. Test a paint for barium sulphate.
66. Make aniline black.
67. Test some salts for their cleaning power.

PROBLEMS.

Make the problems a part of the laboratory work.

NOTE.—The first numbers refer to the number of the experiment in the Laboratory Manual as well as to the number of the problem; the second numbers refer to the subdivisions of the experiment.

1, 8. The temperature of the room is 20 degrees C.; what is it F.? Seventy degrees F. will make how many C.?

2, 2. If a piece of magnesium wire weighs 6 grams, how much ash will it make when burned?

3, 4. In making baking powder, if 21 grams of soda are used, how much cream of tartar should be mixed with it?

4, 1. If 4 grams of sulphur are ground with iron filings and then

heated to make ferrous sulphide, how much iron filings must be used to completely react with the sulphur?

5, 1. Thirteen grams of zinc will give off how many grams of hydrogen when treated with an excess of hydrochloric acid?

5, 2. Eleven and one-half grams of sodium will set free how many grams of hydrogen when reacting on an excess of water?

5, 3. Find how many grams of aluminum it will take to set free .027 grams of hydrogen when acting on an excess of sodium hydroxide.

5, 4. Find the relation between the volume of water and the volume of hydrogen and oxygen that can be obtained from it by complete electrolysis.

6, 1. Find the number of grams of sulphuric acid necessary to react with 16.25 grams of zinc. How much hydrogen will it set free?

7, 1. Find the number of grams of magnesium necessary to react with 24.5 grams of sulphuric acid.

8, 2. Find the number of grams of oxygen given off when 7 grams of mercuric oxide are completely decomposed by heat.

8, 3. Find how much oxygen is set free when 261 grams of manganese dioxide are decomposed by heat.

8, 4. What per cent of potassium chlorate is oxygen?

8, 5. How much oxygen will be set free when 338 grams of barium dioxide are heated?

8, 6. A gram of sodium peroxide will set free how much oxygen when added to 20 c.c. of hot water?

9, 1. Find weight and the volume, at normal conditions, of oxygen obtainable from 61 grams of potassium chlorate.

9, 4. How much phosphoric acid can be made by burning 15.5 grams of phosphorus and allowing the pentoxide to unite with an excess of water?

10, 1. A piece of pure iron weighs 16 grams; if completely rusted, what would the ferric oxide weigh?

11, 1. If hydrogen is passed over 5 grams of hot copper oxide until all the oxygen is removed, how much water will be formed?

12, 1. What per cent of zinc sulphate, $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$, will be driven off as water when heated to its anhydrous form?

12, 2. How much water can be obtained from 10 grams of pure gypsum, $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$, until it becomes CaSO_4 ? What per cent of the 10 grams is this weight?

12, 3. If blue vitriol is $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, what per cent of it is anhydrous copper sulphate?

13, 1. If 10 grams of sugar is dissolved in 25 c.c. of water, what per cent of the whole solution is sugar?

14, 2. In what proportions should lime and alum be added to water to purify it?

15, 1. If sodium sulphate, $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$, is left to effervesce until all the hydrogen and oxygen in the water of crystallization have formed water and evaporated, what per cent of its original weight has it lost?

16, 1. What per cent of calcium chloride is chlorine?

17, 1. If 5 grams of salt are dissolved in 15 grams of water, what per cent of the whole solution is salt?

18, 1. Twenty-five grams of pure manganese dioxide with an excess of hydrochloric acid will set free how much chlorine?

19, 1. What per cent of bleaching powder is chlorine?

20, 1. How much potassium chlorate and how much potassium chloride can be made from 20 grams of potassium hydroxide by saturating it with chlorine?

21, 1. How much hydrochloric acid can be made from 50 grams of sodium chloride and an excess of sulphuric acid?

22, 1. If hydrochloric acid is 40 per cent pure, density 1.2, how much sodium hydroxide will 20 c.c. of it neutralize?

23, 1. What per cent of ammonium nitrite is nitrogen?

24, 5. What is meant by normal conditions of a gas?

24, 6. What would be the volume, at normal conditions, of 98 c.c. of air, over water, temperature 20, barometer 73.7?

24, 7. What will a liter of oxygen weigh in this room?

25, 1. If a cylinder contains a liter of air, at normal conditions, how much phosphorus will it take to burn the oxygen out of it, making phosphorus pentoxide?

26, 1. How much lime will it take to react with 20 c.c. of water to make calcium hydroxide?

27, 5. How much ammonia can be made from 30 grams of ammonium chloride with an excess of slaked lime?

28, 1. Forty grams of sodium nitrate with an excess of sulphuric acid will make how much nitric acid?

29, 1. How much lead will it take to reduce 8 grams of sodium nitrate to sodium nitrite?

30, 1. Find the percentage composition of all the nitrogen oxygen compounds.

31, 1. How many grams will 45 c.c. of sulphur weigh?

32, 1. Fifteen grams of ferrous sulphide with an excess of sulphuric acid will give how much hydrogen sulphide?

33, 1. A gram of sulphur burned and united with an excess of water will form how much sulphurous acid?

34, 3. If natural gas were pure methane, what per cent of it would be carbon?

35, 1. How much copper can be obtained by heating 100 grams of pure copper oxide with an excess of charcoal?

35, 2. How much free arsenic can be made by heating an excess of arsenic trioxide with 100 grams of pure carbon?

36. One hundred grams of marble will make how many grams of carbon dioxide? How many c.c. will it make?

37, 1. Ten grams of oxalic acid with sulphuric acid will give off how much carbon monoxide and how much carbon dioxide?

38, 2. What proportions by weight and by volume should natural gas and air be mixed to get complete combustion, if the gas is pure methane and 20 per cent of the volume of air is oxygen?

APPARATUS.

FOR EACH PUPIL.

- | | |
|--|---------------------------------------|
| 1 sand bath, 10 cm. | 1 box of safety matches. |
| 4 plain beakers, assorted. | 1 porcelain mortar and pestle. |
| 1 brass blowpipe, 20 cm. long. | 1 sheet of drying paper. |
| 5 reagent bottles, 120 c.c. with g. s. | 25 cut filter papers. |
| 1 Bunsen burner with rubber hose. | 1 piece of litmus paper. |
| 1 wire candle holder. | 1 pneumatic trough. |
| 1 small collar and clamp. | 1 ring stand and 2 rings. |
| 25 corks, assorted. | 1 deflagrating spoon. |
| 1 ground glass cover, 10 x 10 cm. | 2 rubber stoppers. |
| 1 gas cylinder. | 1 wire test tube holder. |
| 1 graduated cylinder, 50 c.c. | 1 iron tripod. |
| 1 evaporating dish, No. 4. | 1 calcium chloride tube. |
| 3 German flasks, 500, 250 and 100 c.c. | 12 specimen tubes. |
| 1 oxygen flask, 150 c.c. | 12 test tubes. |
| 1 two-necked Woulff's flask. | 1 eight-inch test tube. |
| 1 pair of steel forceps. | 1 thistle tube. |
| 2 glass funnels, 8 cm. and 4 cm. | 1 meter of glass tubing (39.37 ins.). |
| 1 piece of asbestos gauze. | 30 centimeters of small rubber tubing |
| | 1 watch glass. |

TO BE CHECKED OUT TO THE PUPILS.

A stock of the above.
Burettes.
Eudiometers, 100 c.c.
Copper wire gauze.
Weights.

Platinum wire.
Retorts, 250 c.c.
Lead dishes.
Magnifying glasses.

FOR THE USE OF THE CLASS.

Horn pan balances.
Barometer.
Thermometers.
Cork borers.

A Babcock milk tester.
A good, light room in which to work.
Good tables of proper height.

CHEMICALS.

Acetic acid, $\text{HC}_2\text{H}_3\text{O}_2$.
Alcohol, ethyl, $\text{C}_2\text{H}_5\text{OH}$.
Aluminum, wire and powder, Al.
Arsenic, As.
Arsenic trioxide, As_2O_3 .
Alum, $\text{KAl}(\text{SO}_4)_2$.
Ammonium carbonate,
 $(\text{NH}_4)_2\text{CO}_3$.
Ammonium chloride, NH_4Cl .
Ammonium hydroxide, NH_4OH .
Ammonium molybdate,
 $(\text{NH}_4)_2\text{MoO}_4$.
Ammonium nitrate, NH_4NO_3 .
Ammonium sulphate, $(\text{NH}_4)_2\text{SO}_4$.
Ammonium sulphide, $(\text{NH}_4)_2\text{S}$.
Antimony, Sb.
Antimony chloride, SbCl_3 .
Barium chloride, BaCl_2 .
Barium nitrate, $\text{Ba}(\text{NO}_3)_2$.
Barium sulphate, BaSO_4 .
Bismuth, Bi.
Bismuth chloride, BiCl_3 .
Bismuth nitrate, $\text{Bi}(\text{NO}_3)_3$.
Borax, $\text{Na}_2\text{B}_4\text{O}_7$.
Bleaching powder, CaCl_2O .
Cadmium sulphate, CdSO_4 .
Carbon disulphide, CS_2 .
Calcium chloride, fused, CaCl_2 .
Calcium fluoride, CaF_2 .
Carbon, charcoal and animal charcoal, C.
Chloroform, CHCl_3 .
Cobaltous chloride, CoCl_2 .
Cobaltous nitrate, $\text{Co}(\text{NO}_3)_2$.
Copper, foil and turnings, Cu.
Copper sulphate, CuSO_4 .
Copper oxide, powdered and wire form, CuO.
Chromic chloride, CrCl_3 .
Cupric chloride, CuCl_2 .
Ether, $(\text{C}_2\text{H}_5)_2\text{O}$.
Ferric chloride, FeCl_3 .
Ferrous sulphate, FeSO_4 .
Ferrous sulphide, FeS.
Glycerine, $\text{C}_3\text{H}_5(\text{OH})_3$.
Gypsum, $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$.
Hydrochloric acid, HCl.
Hydrogen peroxide, H_2O_2 .
Hydrogen sulphide, H_2S .
Iodine, I.
Iron filings, Fe.
Lead, Pb.
Lead acetate, $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2$.
Lead nitrate, $\text{Pb}(\text{NO}_3)_2$.
Lime, CaO.
Litharge, PbO.
Magnesium wire, Mg.
Magnesium sulphate, MgSO_4 .
Manganese dioxide, MnO_2 .
Marble chips, CaCO_3 .
Mercury, Hg.
Mercuric chloride, HgCl_2 .
Mercurous nitrate, HgNO_3 .
Mercuric nitrate, $\text{Hg}(\text{NO}_3)_2$.
Mercuric oxide, red, HgO.
Nickelous nitrate, $\text{Ni}(\text{NO}_3)_2$.
Nitric acid, HNO_3 .
Oxalic acid, $\text{H}_2\text{C}_2\text{O}_4$.
Phosphorus, red and yellow, P.
Phosphoric acid, H_3PO_4 .
Plaster of Paris, $(\text{CaSO}_4)_2 \cdot \text{H}_2\text{O}$.
Potassium bitartrate, $\text{KHC}_4\text{H}_4\text{O}_6$.
Potassium bromide, KBr.
Potassium chlorate, KClO_3 .
Potassium chromate, K_2CrO_4 .
Potassium chloride, KCl.
Potassium cyanide, KCN.
Potassium dichromate, $\text{K}_2\text{Cr}_2\text{O}_7$.
Potassium ferricyanide, $\text{K}_3\text{Fe}(\text{CN})_6$.
Potassium ferrocyanide, $\text{K}_4\text{Fe}(\text{CN})_6$.
Potassium Hydroxide, KOH.
Potassium iodide, KI.
Potassium nitrate, KNO_3 .
Potassium perchlorate, KClO_4 .
Potassium permanganate, KMnO_4 .
Potassium sulphate, K_2SO_4 .
Potassium sulphocyanate, KSCN.
Salt, common, NaCl.
Silver foil, Ag.
Silver nitrate, AgNO_3 .
Soda, baking, NaHCO_3 .
Sodium, Na.
Sodium carbonate, Na_2CO_3 .
Sodium hydroxide, NaOH.
Sodium nitrate, NaNO_3 .
Sodium nitrite, NaNO_2 .
Sodium peroxide, Na_2O_2 .
Sodium sulphate, Na_2SO_4 .
Stannic chloride, SnCl_4 .
Stannous chloride, SnCl_2 .
Strontium nitrate, $\text{Sr}(\text{NO}_3)_2$.
Sugar, cane, $\text{C}_{12}\text{H}_{22}\text{O}_{11}$.
Sugar, glucose, $\text{C}_6\text{H}_{12}\text{O}_6$.
Sulphur, S.
Sulphuric acid, H_2SO_4 .
Tartaric acid, $\text{H}_2\text{C}_4\text{H}_4\text{O}_6$.
Tartar emetic, $\text{KSBOC}_4\text{H}_4\text{O}_6$.
Tin, Sn.

CHEMICALS—*concluded.*

Zinc, granulated, Zn.	Oil.
Zinc sulphate, ZnSO_4 .	Glass.
Water, distilled, H_2O .	Starch.
Litmus, better, azolitmin.	Foods.
Colored goods.	Aniline.
Baking powder.	Formaldehyde.
Milk.	

BOTANY.

One Unit.

The recommendations of the College Entrance Examination Board on botany in secondary schools, which are in practical agreement with the report of the North Central Association of Colleges and Secondary Schools, are discussed in Ganong's Teaching Botanist with a fullness of detail impossible in an article of this scope. A careful study of that masterly analysis of the problems of secondary botanical instruction is advised to fill in the outlines of this account.

THE FUNCTION OF BOTANICAL INSTRUCTION

In common with related sciences, botany affords training in exact observation and in reasoning from the data so obtained, and this cultivation of "organized common sense" is the first consideration in determining the method and content of the course. The information gained by the student should be that which will be of most worth to him. What knowledge about plants will be of most value to the high-school student? He should know those things which will enable him to interpret the plant life which he sees about him, the fundamental processes carried on by plants, their relation to their environment, and their influence on human welfare. Interest in plant life should be broadened and deepened. As the student learns the similarity of the fundamental processes in all living things, he may come to see that all life is one, that likeness is greater and more full of meaning than difference, and that he is not an alien in a hostile world, but that his welfare is interwoven with that of the plant life about him. Not only the crops of direct economic value need his intelligent control; just as vital to him is an appreciation of the inconspicuous services of the soil bacteria, in association with the pea family, in enriching the soil by a chemistry still beyond our skill; of the forests at the sources of rivers, whose roots make of the soil about them a great sponge, to hold the rains and feed them steadily into the streams, so that they may neither flood nor run dry; of the scarcely noticed lichens, which penetrate into barren regions, help to grind up the rocks, and by their life and death make place for a richer vegetation; and even of the bacteria of decay, whose work, disastrous when uncontrolled, is fundamental to the continuance of new organisms. And with this deepened appreciation of the silent but active life about him there may develop a sense of keen enjoyment of the harmonious and steadfast working of law.

It should be an important function of the botany course to furnish direct assistance to those intending to enter the vocation of agriculture, and the course in botany may be so arranged as to prepare for the study of agriculture by laying especial stress upon the physiology and ecology of plants, by using such economic families as the grass, legume, rose, parsley, mustard, and the families of noxious weeds, and by giving more attention to the fungi and bacteria in their relation to plant diseases. More detailed information in regard to agriculture in secondary schools will appear soon in a bulletin from the College of Agriculture of the University of Wisconsin.

METHOD.

The student should study the plants themselves. Materials and directions should be given out at the beginning of the period. At first the directions should be more definite than they need be later, but at no time should they be so specific as merely to supply points for verification. The work may be adjusted to a little above the average of the class, and the swifter may be required to give more detail or extra topics, while the slow pupils should finish their work outside of class. The work should be done thoughtfully, accurately and neatly. It is better to omit an exercise than to do it hurriedly and carelessly. After supplying the materials the teacher should go about helping students individually, from time to time asking the attention of the class to some point that needs general explanation, and at the close of the period summing up the work that has been done.

For the sake of economy of materials and of the instructor's time, but more than all for the sake of the valuable team work that may be developed in the class, the whole class should approach a topic together.

Careful records of the work done should be kept in drawings and notes. Accounts of physiological experiments should contain a statement of the problem to be solved, a description of the experiment used to solve it, with drawings of the apparatus, the results of the experiment, and the conclusions drawn from the results. Wherever possible, data should be tabulated. The drawings should be made on heavy linen ledger paper with a hard pencil (6H Koh-i-noor). The use of India ink is to be encouraged, as this gives a definiteness, finish and permanence impossible to pencil drawings. In this case a softer pencil may be used in making the first draughts. The notes written in ink are to face the drawings, so that drawings and notes may be compared without turning the page. Both drawings and notes should be placed symmetrically on the pages. Before beginning a page of drawings it is to be determined how many are to go on that page, where they are to be placed, and the proportion between object and drawing, so that when the pages are completed they will be pleasing in their symmetry. Drawings should be simple outlines, distinct and neat. They should express intelligently, truthfully and attractively, what the student has learned from his subject. To allow slovenly work to pass is to miss the point of scientific training. At frequent intervals the teacher should go over with the student his notes and drawings and discuss their merits and the defects that must be corrected before the work is acceptable. As far as possible, the responsibility for getting the notebook in passing condition should be thrown upon the student. This may be done by placing a line in one corner of a plate when it is first examined, and a line across that when the work is satisfactory, and accepting no work not thus passed upon.

The physiological experiments may be set up by the teacher or by a group of students working together. In either case the whole class should follow the experiments closely and record the results. Details of apparatus and directions for conducting the experiments are given fully in some of the books cited below. These physiological experiments should be given a large part in the schedule of work, for they contain some of the most vital and interesting material of the course.

Field excursions are valuable to connect laboratory and textbook work with the natural conditions of plants. Foresight is necessary in planning the work to be done, in order that the time may be used to the best advantage. The teacher should first go over the ground to be visited to select the features most illustrative of the points he wishes to teach. He must then present the problems to be solved to the group of students to be taken to the field. This group should be small, not more than eight or ten for effective work. Definite reports of the work done should be required.

THE PREPARATION OF THE TEACHER.

Growing emphasis is being laid on the preparation necessary for the teacher of botany. Unless the teacher has had adequate preparation in botany it would be better not to offer the course. What preparation is adequate? The answer varies somewhat with the personal equation. The minimum advisable is the equivalent of two years of college work in botany, including courses in the general morphology of the higher and lower plants, experimental plant physiology, plant histology, and systematic botany with field work, or such courses as botany 1-3, 51, 52, described in the University Catalogue of 1910-'11, or botany 1-3, 4, 5, 8 and 12, in the catalogue for 1911-'12 of the Kansas State Agricultural College. Knowledge of current and approved methods of teaching botany, zoölogy, physiography and general bacteriology are desirable. If a teacher finds that his preparation does not enable him to teach botany with enthusiasm and freedom, he may mend matters by taking work in the summer schools held at several of the large universities or at a seaside laboratory. It is advisable for the teacher who has been well prepared to keep in touch with the advance of the science in matter and method.

LABORATORY EQUIPMENT.

Compared with the enthusiastic, scholarly teacher, the material equipment is secondary. There should be, however, a well-lighted laboratory furnished with flat-topped tables about thirty inches high and so proportioned as to give each pupil about thirty inches elbow room, arranged preferably with the ends towards the window.

For his own use each student should have a dissecting microscope, a simple lens mounted on a block, so as to leave the hands free to use dissecting needles. The doublet magnifiers of three-quarter-inch focus, manufactured by Bausch and Lomb, Rochester, N. Y., or by the Spencer Lens Company, Buffalo, N. Y., are satisfactory. The blocks may be made as described in Stevens's Introduction to Botany, page 371. The Barnes dissecting microscopes, made by Bausch and Lomb, and listed at \$2.50, but subject to discount, are good. The iron stands with hand rests and rack and pinion adjustment made at the shops of the University of Kansas are of large and convenient size and made for long service; net price, \$2.75. The other tools indispensable for the individual student are two dissecting needles, which may be made easily by thrusting strong needles into soft wood handles, forceps, and a sharp knife.

The laboratory should have at least one good compound microscope for demonstrating minute anatomy. It would be a saving of time to have one for each student. Good microscopes with all the necessary adjustments may be bought by schools for less than \$30 each, from the Spencer Lens Company and Bausch and Lomb. A table microtome and sectioning knife will save much valuable time, and may be bought for \$10. A good hone should be kept in the laboratory to keep the knives sharp. Helpful additions to this necessary apparatus are described in Ganong's Teaching Botanist.

Tools are not the only supplies necessary to provide. In order to carry out the course in logical sequence, plants must be on hand in the proper stages of development for demonstration. For this supply materials may be gathered in a suitable condition, to be used and preserved until the time for them comes in the course, or some of them may be brought to a state where they may be used. For keeping a stock of preserved materials a cupboard is necessary, in which fruits and seeds collected during the summer to illustrate dissemination may be kept safe from mice, and in which sealed jars containing two per cent formalin for preserving flowers and the soft parts of plants, or equal parts of alcohol, glycerine and water for keeping woody materials, may be kept handy and safe from breakage. Some room or part of a room should be kept warm enough to germinate seeds in boxes filled with sphagnum or White-pine sawdust, and to force into bloom branches of woody plants in jars of

water. If the schoolroom is not allowed to get cold, window boxes, with such plants as geranium, wandering Jew, tulip, and others suitable for use in physiological experimentation, are a convenience. Material hard to get in some localities may be obtained from the biological supply firms, such as the St. Louis Laboratory and Supply Company, St. Louis, Mo. Detailed directions for providing materials are given in Stevens's Introduction to Botany and Ganong's Teaching Botanist.

The high-school student's appreciation of pleasant surroundings should not be neglected, and the laboratory should be kept neat and attractive by the combined effort of teacher and pupils, for the sake of its reaction on the neatness and accuracy of their work.

THE PLAN OF THE COURSE.

The two points to be considered in making a plan for the high-school course in botany are, first, the preparation and needs of the teacher and pupils, and second, the materials best fitted to give the desirable training and information. That this plan may be as useful as possible, a large enough range of subjects to fit all probable situations, arranged in a logical order for presentation, will be suggestive, so that the teacher may choose for full treatment those topics best adapted to the needs of his school, and may give others brief treatment or omit them. The quality and quantity of the work done by the pupils and the evidence of power developed are more important in judging the course than the specific content. As for the best path of approach to the field of botany in general, it is that one in which the teacher can lead with the most enthusiasm. In most cases, however, the pupil should not at his very entrance to the botanical world be distracted from the plants themselves by the use of so comforting though useful a tool as the compound microscope. Besides, the general survey of the whole field of botany proper to the high-school course requires that the functions of plants be studied at the same time with the structures that carry them on. Since these physiological processes are more easily demonstrated in the higher plants, it is well on this account also to begin the course with a thorough study of the structure and development of a typical seed plant, accompanied by the physiology of each part as it is taken up and the relation of the part to its environment. When the method of work has become familiar, the use of the compound microscope will open the door to the new and fascinating world of the minute structure of plants. This study of the seed plant should be followed by a general survey of the great groups of plants.

A. The structures of a typical seed plant and the kinds of work done by each part.

1. Seeds and seedlings.

Materials: Lima and other kinds of beans, castor bean and corn. *Phaseolus vulgaris* germinates well.

Structures of the dry and soaked seeds: The nature of the parts; the development of each part in the process of germination; the function of each part; the work of the seed.

Experiments to show: Storage of food in relation to the plant; to men and other animals; kinds of food stored in each seed; what becomes of this food in germination.

Respiration: Need of oxygen in growth; evolution of carbon dioxide. Here is the place to clear up the common notion that plants do not respire like animals, caused by misunderstanding the process of photosynthesis.

Digestion, especially the work of diastase.

Response of the different parts of the seedling to the stimuli of gravity, water and light.

Seed distribution; vitality of seeds.

A. The structures of a typical seed plant—*continued*.

2. Roots.

Materials: Roots of seedlings; sections of older roots of hyacinth; seedlings grown in moist chamber to develop root hairs.

Structure of root, vascular bundle, hair zone, root cap, growing point. Position and origin of lateral roots.

Root hairs, structure, relation of root to soil, kinds of soil and their influence on vegetation. Modified roots: storage, parasitic, air, prop.

Experiments to show: Osmosis and its relation to the function of roots; root pressure.

3. Stems.

Material: Horse chestnut or hickory, cottonwood, and lilac buds; young and old dicot stems, as *Aristolochia*, squash, or castor beans; linden, pine, corn, *Impatiens* stem.

Origin of buds, arrangement and unfolding of young leaves.

Structure of young dicot stem, secondary growth, shedding of bark and leaves, relation of growth of stem to seasons.

Structure of monocot stem.

Experiments to show: Region of conduction; rate of sap flow; region of growth; amount of growth.

Method of twining of stems.

Forests, their uses; the distribution of gymnospermous and angiospermous forests, their enemies, preservation.

United States, state and local work in forestry.

4. Leaves.

Material: Elm, maple, geranium, bean, and *Abutilon* leaves.

Structure: Epidermis, stomata, palisades and chloroplasts, air tissue, and veins.

Light relations of various leaves.

Response to the amount of transpiration shown in forms of leaves of water plants, moist-air plants, and desert plants.

Modifications of leaves for special work: thorns, tendrils, scales, and insectivorous adaptations.

Experiments to show: Presence and nature of chlorophyll; manufacture of food and its conditions; dependence of starch formation on presence of chlorophyll, light, and carbon dioxide; evolution of oxygen; make clear the distinctiveness of the process of photosynthesis; rate of transpiration in dry and moist atmosphere.

5. Flowers.

Material: Begin with simple flowers like tulip, dog's-tooth violet, or yucca, and lead up gradually to the more difficult flowers, like the Compositæ.

Structure of the flower, especially of ovule and pollen; functions of parts. Devices for cross-pollination; relation of insects to pollination. Fertilization. Artificial selection and methods of improving agricultural and horticultural plants.

Classification of plants and acquaintance with plants of the locality, especially those of economic importance.

B. Summary of the great groups of plants.

This should be chiefly habit study of the plants themselves, related as far as possible to the locality and conditions of growth of the plant. Anatomical details are better shown in diagram, charts, lantern slides or from good illustrations in books than

- B. Summary of the great groups of plants—*continued*.
 by individual work of the pupils with the compound microscope; and these details should be subordinated to ecological and physiological aspects of the plants. Some details may be worked out with the compound microscope, and should be subordinated to the ecological and physiological aspects of the plant, and a demonstration microscope should be used.
1. Algæ.
 Distribution; conditions controlling growth; relation to water supply. One or two blue-greens should be studied, as *Nostoc* and *Oscillatoria*. Common green algæ, like *Pleurococcus*, *Cladophora*, *Spirogyra*, *Vaucheria* and desmids.
 Development in complexity in nutritive and reproductive structures.
 General appearance and distribution of browns and reds.
 Gross characters of diatoms.
 2. Fungi.
 Types of dependent plants: Toadstools, mushrooms, mildews, moulds, wheat rust, corn smut, cedar apples. Yeasts; experiments to show behavior and structure. Bacteria from hay infusions. Relation of bacteria to disease, soil, decay; effect on milk and water supply. Health measures in relation to bacteria.
 Parasitism; effect on host and parasite; economic effect.
 3. Lichen.
 Symbiotic relationship; distribution; effect on rock or other structure upon which it grows.
 4. Liverwort and moss.
 Distribution; life history. The fact of alternation of generation should be taught, but not in too great detail.
 5. Fern.
 Life history of true fern; differentiation in structure; distribution; acquaintance with local representatives.
 General appearance of horsetails and club mosses.
 6. Gymnosperms.
 Tree habit. Annual growth; twigs of different ages; evergreen leaves and their value. The timber and its qualities. Cones; structures involved in the development of the seed, and the time necessary for the development of seeds.
 7. Angiosperms.
 Life history compared with gymnosperms; modifications of leaves, stems, roots, flowers.

Some topics suggested in the first part of the course may be deferred until this point is reached, or treated more fully here. For instance, if the course begins in the fall the acquaintance with local families and problems of forests and forestry may be taken up at this time, as this would bring the study into the spring when the simpler flowers are in bloom.

HELPFUL BOOKS FOR THE BOTANY COURSE.

The Teaching Botanist, by William F. Ganong (Macmillan Company, New York, edition of 1910), is a full and up-to-date discussion of the problems of secondary botanical instruction. It contains information indispensable for the high-school teacher, and is written in a fresh and attractive style.

Introduction to Botany, by William C. Stevens (D. C. Heath & Co., Boston), gives detail and practical direction helpful to both teachers and students. This book combines the clearness and simplicity attractive to the student with suggestions of method valuable to the teacher.

Plant Relations and Plant Structures, by J. M. Coulter (D. Appleton & Co.), are beautifully written and well illustrated. A Textbook of Botany, by Coulter, Barnes and Cowles (American Book Company), is the latest and best presentation of the field of botany for reference by the teacher.

The Textbook of Botany, by Strasburger, Noll, Schenck, and Schimper (The Macmillan Company), is written by specialists in its different parts, and is one of the most satisfactory texts yet published.

Plant Life, by C. R. Barnes (Henry Holt & Co., New York), is a clear and logical presentation of the subject from the standpoint of the relation of form to function.

Principles of Botany, by Bergen and Davis (Ginn & Co., Boston), is an excellent book for the library on account of its popularity with the students.

Plant Physiology, by William F. Ganong (Henry Holt & Co., New York), has clear and careful directions for carrying out the experiments demanded in the course outlined.

An Introduction to Vegetable Physiology, by J. R. Green; Plant Anatomy, by W. C. Stevens (P. Blakiston's Son & Co., Philadelphia), and Plant Physiology, by Peirce (Henry Holt & Co., New York), are excellent for the teacher's reference.

The Natural History of Plants, by Kerner & Oliver (Henry Holt & Co., New York), should be in the library for reference to its fine illustrations, and full ecological information.

ZOOLOGY.

The course in zoölogy can most profitably be undertaken in the third or fourth year of the high-school course. By that time the student has acquired sufficient skill and experience to comprehend the facts presented and to grasp the broader biological features involved.

ROOM.

If microscopic work is undertaken the laboratory should have a north exposure, though south windows are an advantage in growing certain lower forms of animal life. The equipment may be very simple and inexpensive, if necessary. The tables should be about twenty-eight inches high and should afford convenient working space for each student. If new tables are built, tiers of drawers sufficient for each pupil to have a separate one in which to keep drawings, notebooks, etc., are recommended. If sufficient drawer space is not obtainable, a case or closet should be provided, so that work may be safely and neatly kept. Chairs are to be preferred rather than stools, because growing children of high-school age need an occasional rest.

APPARATUS FOR PUPIL.

Apparatus for the pupil should consist of a set of dissecting instruments for each, and a hand lens. The dissecting instruments necessary to good work are: A pair of scissors, 75 cents; a pair of forceps, 25 cents; two needles, 3 cents; a pipette, 3 cents; and a scalpel, 3 cents. Dissecting pans may be made from ordinary oblong (8 x 10 x 2) cake or pie tins. These should have a layer of paraffin about one-third of an inch in thickness on the bottom. (Heat the paraffin in a vessel, set in a vessel of water, to just above the melting point, and stir in lampblack sufficient to turn the mixture black. Pour it into the pan and cool rapidly.) Boards may be used for dissecting larger animals, as cats or rabbits.

Compound microscopes may be used by pupils in groups. Good work may be done with only one compound microscope if the class is not large. If several compound microscopes are available, three objectives, a two-inch, a two-thirds and a one-sixth objective used with a triple nose piece saves the expense of a dissecting microscope and hand lens.

APPARATUS FOR ROOM.

A number of large glass jars of any sort are handy for small aquatic animals. A tank or tub of galvanized iron is useful for keeping alive crayfish, fish or clams until needed. Wide-mouth bottles and ordinary fruit jars serve well for preserving material for class demonstration. Formaline is a cheap and good preserving fluid. Solutions from 2 per cent to 10 per cent, differing according to the size of the animal, will preserve material indefinitely.

LABORATORY MATERIAL.

Material for class work may be collected for the most part by the class on individual or class excursions. Protozoa are abundant in stagnant water. Amoebæ are often found in growths of *Oscillatoria* (bluish-green masses of shiny growth on the bottoms of ponds). Many protozoans may be grown by placing a small quantity of dry leaves in a jar of water and keeping them in a warm place for a few days or weeks. The jars should be watched from time to time and the Protozoa studied when they are plentiful, because they are preyed upon by larger forms and disappear suddenly from the solution. Roadside ditches are always sources of Protozoa.

Hydræ are usually abundant in early fall on the under side of floating lily pads, also among duckweed (a small floating aquatic plant forming a green layer on the surface of quiet water).

Collect either the pads or duckweed and place in jars or crocks. Look for Hydræ the following few days. They will be found around the sides of the vessel fastened by one end of the body, the free end extended from one-fourth to one-half inch in length and the six slender tentacles in constant motion.

Earthworms may be found in rich garden soil at any time of the year when the ground is not frozen. If needed in the winter time, they should be dug in the early fall, before frost, and placed in a large *tight-bottomed box*, with plenty of rich earth, which should be kept moist, but not wet, until they are used.

Cyclops, Daphnia and related arthropods are sure to be brought in with the Protozoa, though they will develop slower and may not be noticed at once. Care should be taken to study the Protozoa before the Cyclops have increased in numbers sufficiently to destroy the smaller forms.

Crayfish must be collected for winter use early in the fall, by the middle or last of September. Hunt for them in quiet running water, where logs or rubbish form hiding places. A piece of liver on a string forms an attractive bait. If kept alive until needed, they may be placed in a tub or tank containing a layer of sand three or four inches deep, and covered with water an inch or two (not more) above the level of the sand. Crayfish do much better in shallow water, unless running water may be had. Feed live earthworms or pieces of raw meat. The excess food should be removed, so as not to foul the water.

Clams are found in a creek with a sandy bottom, often above and below a riffle or fall. To wade out and pick them up is the quickest method of collecting. They may be kept with crayfish if not overcrowded. The water should be changed daily.

Frogs and toads are found best in early spring around ponds. At dusk they are abundant and easily taken with a dip net.

Cats and guinea pigs are much cleaner and pleasanter to dissect than rabbits. Farmers and grocers often have extra cats which they are glad to dispose of.

PUPILS' COLLECTIONS.

Each pupil should collect in early fall from twenty-five to fifty specimens of insects, as many species as possible, and related arthropods for classification. The insects should be neatly spread and arranged in boxes. Split corks glued to the bottom of the box serve to hold the pins

in place. The pupil should also collect two or more specimens of each insect to be studied. A good collection should contain grasshoppers, large beetles, bugs (electric-light bug, cicada and squash bug), butterflies, moths, crickets (male and female), bumblebees, wasps, dragon flies, and flies. These collections should be preserved by the teacher until needed for class work.

NOTEBOOK WORK.

Loose-leaf notebooks of ledger linen for drawings and single ruled writing paper for notes are practical. The drawings should be made in pencil, 3 x 4 x 1, and after correction should be traced in India ink. Drawings should be made of every part studied in the dissection and should be fully and correctly labeled. Drawings without lettering are worthless. After the dissection is completed the pupil should write, in composition form, a description of the animal, including (1) its habitat, (2) adaptations to environment, (3) a full description of the laboratory work, (4) its life history, and (5) its classification.

In all notebook work attention should be given to spelling, the use of language, and the rules of composition.

OUTLINE FOR WORK.

It is difficult to follow the logical order of development of animals in laboratory work, because of the inexperience of pupils and because we must study many forms out of their season. A satisfactory method of presentation is to study the insects in the fall, because they are at their best at this season. Many forms are laying eggs; larvæ are pupating and pupæ are hatching. Work with insects will give the pupil the necessary skill, so that he may be able to take up the study of the protozoans and continue in the natural order of development.

Insects. Because of its size, the grasshopper is the form most thoroughly studied, and it may serve for the type dissection of the insects. As the study of the different orders progresses, comparison of homologous parts with all previous forms studied should be made. A chart made by the pupil, showing the comparison of structures upon which the basis of classification is made, is highly instructive and should conclude the study and precede the classification of the insects collected. It should include: (1) parts of body, character of; (2) mouth parts; (3) antennæ, number and kinds of; (4) eyes; (5) wings; (6) legs; (7) number segments of abdomen; (8) habitat; (9) relation to mankind. (a) harmful, (b) beneficial. The economic importance of insects should form a prominent part of the study. To make such study practical and effective the student must know the life history of the insect, at which stage or stages it is harmful, the character of the mouth parts in the different stages, and the egg-laying habits. If beneficial he must know the kind of service it renders mankind. He is then in a position to appreciate literature on the subject and to plan and execute aggressive or defensive measures for the destruction or protection of the insect. All schools should avail themselves of the opportunity offered by the Agricultural College at Manhattan to supply themselves with bulletins offered on this and related subjects.

Protozoans. The study of the protozoans depends largely upon the equipment of the school. If compound microscopes are available the regular work may be attempted, but even with hand lenses much may be learned. The point to be brought out is that the simplest animals, with only one cell, perform many of the functions that the higher animals perform by means of organs.

Hydra. The hydra is important because it is the commonest freshwater cœlenterate, of which it may be made a type. The structure of corals and Hydrozoa are easily explained from the structure of hydra. It is important biologically because the three body layers common to the early embryological stages of all higher animals are developed here

Definite cells of these layers (nerve cells, muscle cells, digestive cells, reproductive cells) foreshadow organs with similar functions in the higher animals.

Earthworms. The earthworm is difficult to handle in class dissection, but with several specimens per pupil a number of successful dissections can be made. In evolution of animals the earthworm is the first form the pupil meets which shows the various systems. These are developed to complexity, but do not occupy the same relative positions shown in higher animals. A chart showing the evolution of the animal systems should be begun with this dissection. Show the circulatory system, dorsal; the digestive, median; and the nervous, ventral, with the reproductive system anteriorly located. Compare with grasshopper and add diagram of the latter. Notice the similarity of position of circulatory, digestive and nervous systems, but change of location of reproductive system. Notice also the development of a respiratory system in the insect. Preserve the chart and add to it as the work progresses.

Clam. The clam is one of the most difficult dissections which the pupil will make. The shell and external study of the body are simple, though care must be taken to make clear the relation between mantle, gills and body. The internal dissections may be thoroughly understood and fairly worked out with the help of a good diagram. Make clear the relation of the kidney to the pericardial cavity. While the clam shows the same general location of the various vital systems, it shows general advance in their complexity. The three-chambered heart, with arteries leading from it, the return blood being taken to the gills for aëration instead of the air being taken to the tissues, as in the insects, is a distinct advance. The coiled intestine shows a development over the straight tube of the worm.

The Mollusca are interesting commercially because of the pearls and mother of pearl used in the arts. They are of interest geologically because of the enormous quantities of limestone formed from the shells, etc.

Crayfish. Note similarities and differences between insects and crayfish, covering and general divisions of body, jointed legs, the antennæ, and mouth parts. Note special adaptations, flexible abdomen, tail, fin and gills. Observe the marked increase in complexity of some of the internal organs; the large liver, the heart and arteries, different kidneys. Note the similarity of arrangement of the internal organs. Add diagram to chart.

Catch female crayfish with eggs attached to swimmers, and watch them hatch and develop.

Consider here the large lobster hatcheries along the northeastern coast, and the restocking of these waters.

Fish. Study different kinds of fish from minnows brought into the room. General body covering; different kinds of fins and their different location; difference in mouth. It is well to dissect different kinds of fish. Croppies or perch are good for internal dissection and catfish are good for dissection of nervous system and brain. With the appearance of the vertebrate animals notice the complete change of arrangement of vital organs; the dorsal nervous system, the circulatory system lying between it and the ventral alimentary canal. Study the complex nervous system, with well defined brain instead of scattered ganglia as in the invertebrates. Notice that with the development of brain there is developed also the bony cavity to enclose and protect it. Notice that the three-chambered heart pumps venous blood instead of arterial as in the crayfish. Notice the breaking up of the gill arteries into capillaries and the subsequent uniting again into arteries. Note the development of veins conveying the blood back to the heart instead of sinuses as in the crayfish. Study also the evolution of the kidney: in the worm in each segment except the few anterior ones; the malpighian tubes of the grasshopper; the anterior kidney of the crayfish; and the migration to the

middle to posterior position in body cavity of vertebrate. Compare this evolution with the development of the kidney in the vertebrate embryo, where each segment of the young embryo contributes to the kidney, which by the more rapid growth of the anterior portion of the body is left to occupy the lower middle portion of the body cavity. Compare with this the same general situation in regard to the reproductive organs: anterior in the earthworm, median in the crayfish, and posterior in the fish. Notice in the fish the enormous number of eggs and spawns developed, and study the relation between the care given the young by the parent and the number of young produced in order to perpetuate the species.

Study here the fish industry as undertaken by the United States government: the care of eggs and young fish; the stocking of streams; the kinds of fish best adapted to Kansas waters and the protection which should be given them.

Add diagram of vital systems to chart. Make diagram of circulating system.

Frog, Toad, Turtle, Snake. The amphibians and reptiles may be studied together. Have at least one specimen of each dissected in class. Each pupil may then observe dissections made by the other members of the class, and so get the benefit of all. The great advance here is from the water-breathing to the air-breathing form. Review in this connection the aëration of the blood in the previous forms studied: in the earthworm breathing takes place through the moist skin; external gills in the clam, etc.; their first connection with the mouth cavity in the vertebrate. Notice that in the frog and toad the gills develop in connection with the mouth, as in the fish; but later lungs develop as outgrowths of the esophagus, a change that takes place in the embryological stages of the higher vertebrates by a longitudinal division of the esophagus.

Note slight advance of three-chambered heart of fish to the partly divided ventricle of amphibians and reptiles. Continue comparisons through the different organs.

Collect frogs' eggs in the spring and watch them hatch and develop. They should be put in a vessel that has algæ growing on the sides. Teach the value of amphibians and reptiles in catching insects and small rodents. Snakes are especially valuable, and the harmless varieties should be protected.

Pigeon or Sparrow. The pigeon is to be preferred because larger. The birds show a generalized advance over preceding types, as well as many special adaptations. Here the four-chambered heart is first found, and with it the highest type of circulation and the appearance of warm-blooded animals. The pupil should carefully work out the circulation and make original diagrams of it. The brain is much increased in size. Note the relative change in size of the cerebellum and optic lobes of the bird and frog. Make careful dissection of nerves to internal organs, to wings and toes. Study carefully the close relationship in position of the kidneys and reproductive system, and show that here, as well as in the embryonic stages of both lower and higher animals, these organs developed from a common body by longitudinal subdivision, the dorsal portion becoming the kidney and bladder, the ventral portion the reproductive organ.

Clear away enough of the flesh to get a good general idea of the skeleton, especially the wings and back at the lumbar regions.

In the study of birds consider their value to the farmer. Devise methods of protection against the destruction of birds. Consider this point both from humane and economic viewpoints.

Cat or other Mammal. The mammal should be the most important dissection made. Six weeks may be profitably spent upon it. If crowded for time the bird may be dissected by part of the class at the same time the amphibians and reptiles are being studied. The animal should be skinned and the whole muscular system worked out thoroughly. The origin and

insertion of muscles and their action is much more important than names. The blood and nerve supply of each large muscle should be observed. This is readily done if the arteries are injected with plaster of Paris containing carmine or red ink. Inject through the ventricles or auricles. Follow the dissection of nerves and arteries to the toes.

The internal dissection should be done with especial care. The diaphragm is the new organ developed in connection with the respiration. Trace the arteries and veins of the internal organs very carefully and make original diagram of complete circulation of blood, using colors. Study carefully the alimentary canal, and show that the liver and pancreas are developed from embryological outgrowths of intestine, which show their relation to it by the gall and pancreatic ducts. Note the increased complexity of the mammalian reproductive organs, due to intrauterine development of embryo.

Careful dissection of the brain and spinal cord should be made. The skull of the animal should be opened by a blow with a hammer or with bone forceps as soon as killed, so that the formaline used may harden the brain tissues. Notice the increase of cerebrum over the other portions of brain and the complete disappearance of the optic lobes. Dissect the spinal cord, showing cervical and lumbar plexuses. Find the dorsal and ventral roots of the spinal nerves. A careful dissection here is of great value to the pupil in subsequent study of psychology. In the mammal make drawings of important parts only: in the alimentary canal, the tongue, showing relation of tongue, epiglottis, esophagus and trachea; the stomach and portion of intestine, showing the pancreas; the cæcum at junction with ileum, etc. Make careful drawings of nervous systems; the urogenital system of both sexes; the heart, showing relation to lungs; the lungs and trachea; cross and longitudinal sections of the heart.

If time permits, a careful preparation of the skeleton makes an interesting museum specimen.

The above outline is intended to be merely suggestive. A good laboratory guide, such as Colton's Laboratory Manual, is essential to careful work.

The following books are valuable for reference: Colton's Elementary Zoölogy; Parker and Haswell's Shorter Course in Zoölogy; Comstock's Insect Book; Kellogg's Insect Book.

AGRICULTURE.

One unit.

More and more, society is coming to realize that subjects vitally related to the life of the community should be taught in the public schools of that community. The public schools, supported largely by local taxation, as they are, should work out in higher levels of community life. The progressive leaders in public education are applying the efficiency test to all the subjects in the courses of study for the public schools. The test is: (1) Is it educational? (2) Will the mastery of it result in higher health, economic, social, or moral levels of community life? The educational as well as the economic value of agriculture as a school subject is no longer questioned. Agriculture will help hitch up the work of the high school to the life of the community better than any other high-school subject.

The outline of instruction in agriculture which follows is based upon the "Elements of Agriculture," by G. F. Warren (The Macmillan Company, Chicago), for classroom instruction, and "A Unit in Agriculture," by J. D. Elliff (Row, Peterson & Co., Chicago), for laboratory work. The subject can be presented satisfactorily in three recitation periods and two laboratory periods a week. The laboratory period should be double the time of the class period and should come as the last exercise in the day. With this arrangement the class may visit neighboring farms with-

out returning to the school after the class period is over. Under no consideration should the course be given entirely as recitation and book work.

The State Board of Education has approved and recommend for use a Laboratory Manual of Agriculture for High Schools, by Call and Schaffer, of the Kansas State Agricultural College, Manhattan. The laboratory references in the following outline may be adapted to this manual by the teacher.

EQUIPMENT.

For satisfactory instruction in agriculture a well-equipped laboratory is necessary. Schools with limited means, introducing agriculture, may obtain satisfactory equipment for not to exceed fifty or seventy-five dollars, if the school has a well-equipped physics laboratory. The instructor in agriculture should not be satisfied with this limited equipment; as more money is available additional equipment should be purchased. Much of the laboratory equipment must be home-made. The teacher should plan ahead to see that this equipment is ready when needed. Soil and crop specimens must be collected and prepared. This should be done by teacher and student at the beginning of the school year.

I. SOILS.

1. One bushel of clean sand.
2. One bushel silt loam or sandy loam soil.
3. One bushel clay soil.
4. One peck well-rotted leaf mold.
5. One bushel rich surface soil for growing plants.

II. PLANTS.

1. Seeds of corn, wheat, oats, rye, barley, etc.
2. Heads of wheat, oats, rye, barley, and as many sorghums as possible.
3. Specimen samples of wheat, oats, rye, barley, red clover, white clover, alsike clover, alfalfa, timothy, orchard grass, blue grass, redbud, millet, cowpeas, soy beans, etc.
4. A collection of economic seeds, obtainable free, from the United States Department of Agriculture, Seed Laboratory, Washington, D. C. Send \$1.50 to pay for packing and cases.
5. Several samples of seeds of alfalfa, clover and millet, with prices, should be obtained from reliable Kansas seed houses.

The following minimum equipment should be purchased for a class of ten students, to conduct successfully the laboratory exercises in the following outline:

- One pair of balances weighing to grams.
 - Five glass tumblers.
 - Five thermometers.
 - Five glass or tin funnels.
 - Five small sieves of various size meshes, for sifting soil.
 - Ten wide-mouth, eight-ounce bottles.
 - Twenty pint Mason jars.
 - Ten shallow pans.
 - Ten student lamp chimneys.
 - Ten heavy dinner plates for seed germination.
 - Ten panes of glass (8 x 10 inches).
 - Ten shallow wooden boxes for growing cuttings (12 x 18 x 3).
 - One-half pound small-sized glass tubing—one-fourth inch.
 - One-half pound small-sized glass rods—one-fourth inch.
 - Filter paper.
 - Litmus paper.
 - Several yards of heavy cotton cloth to use in seed germination.
 - One six-bottle Babcock hand tester and supply of glassware and acid.
- Cost, \$10.

Sample of fertilizer to use in fertilizer test when this exercise can be conducted.

Ten grafting knives. Cost, \$3.

A supply of score cards for judging corn, horses, cattle, sheep and swine.

Box of insect pins.

Ten sand crucibles.

One spade.

Fifty glass test tubes.

Box gummed labels.

Ten thistle tubes.

Grafting wax.

One pound cotton.

Two quart Mason fruit jars.

Four pounds copper sulphate, 5 cents' worth of potassium ferrocyanide, small amount of lime.

Small amount of cheesecloth. One or two pounds No. 3 galvanized wire.

Ten small wide-mouth bottles.

A small amount of lumber for making insect boxes, germination boxes, propagation beds, etc.

If possible, a half acre or more of land to use for school garden and experimental field.

In addition to this equipment the following reference books should be purchased; this is a minimum list. Additional books should be purchased as money is available:

1. The Soil, by F. H. King, published by the Macmillan Company, Chicago. Price, \$1.50.
2. The First Principles of Soil Fertility, by Alfred Vivian, published by the Orange Judd Company, New York City. Price, \$1.
3. Cereals in America, by Thomas F. Hunt, published by the Orange Judd Company, New York City. Price, \$1.75.
4. Forage and Fiber Crops in America, by Thomas F. Hunt, published by the Orange Judd Company, New York City. Price, \$1.75.
5. Popular Fruit Growing, by L. B. Green, published by Webb Publishing Company, St. Paul, Minn. Price, \$1.
6. Vegetable Gardening, by L. B. Green, published by Webb Publishing Company, St. Paul, Minn. Price, \$1.
7. Types and Breeds of Farm Animals, by C. S. Plumb, published by Ginn & Co., New York City. Price, \$2.
8. Farm Management, by F. W. Card, published by Doubleday, Page & Co., New York City. Price, \$2.
9. Chapters in Elementary Agriculture, Nos. II, V, and VI, Extension Department. Kansas State Agricultural College, Manhattan, Kan. Free.
10. Bulletin No. 160, Kansas State Experiment Station, Manhattan, Kan. Free.
11. Bulletin No. 203, Bureau of Plant Industry, United States Department of Agriculture. Request bulletin from Superintendent of Documents, United States Department of Agriculture, Washington, D. C. Small charge.
12. The following Farmers' Bulletins, United States Department of Agriculture: Nos. 35, 69, 101, 149, 157, 168, 244, 251, 266, 287, 339, 420, 443, and 448. These bulletins will be sent free upon request to the Secretary of Agriculture, Washington, D. C.
13. A copy for each member of the class of the following Farmers' Bulletins: Nos. 44, 123, 143, 154, 157, 187, 203, 218, 229, 255, and 260.
14. "Corn," by Bowman and Crossley, published by Waterloo Printing Company, Waterloo, Iowa. Price, \$2.

SUGGESTIONS TO THE TEACHERS.

1. Have a definite plan for every lesson. Know what you are going to do and decide in advance as to the material to be used.
2. The laboratory and field work should accompany the study of the same subject in the text.
3. The teacher must be prepared for the work in agriculture if he expects to succeed. While it is a live subject, one filled with great possibilities for arousing interest in the students, it is not a "snap" course for the teacher or for the students. The teacher should be as thoroughly prepared for the laboratory work in agriculture as he is for his laboratory work in chemistry or physics.
4. Every student should keep a notebook in which is carefully recorded the laboratory and field exercises. Insist upon accuracy, neatness and good English. The notebook should contain the date, the subject of every exercise, the material used, description of work done and illustrative drawings of equipment used, etc.
5. It will not be possible for the majority of the high schools of Kansas to have demonstration farms, but the skillful teacher will use the home farms and gardens of the students for demonstrative work. After the theoretical side has been carefully worked out in the classroom and laboratory the teacher should have every student use a plot of the home farm, garden, or vacant lot, to demonstrate some phase of the work which has been worked out during the year. The teacher should get the coöperation of the parents in this demonstration work. Much interest will be added to the work by organizing corn clubs, stock-judging clubs, poultry clubs, etc., in connection with the high school, and then having exhibits and contests in the high-school building sometime during the fall or early winter.
6. A complete list of Farmers' Bulletins should be obtained by the teacher for the school library. These may be procured free, from the United States Department of Agriculture, Washington, D. C. In addition, all available state bulletins should be obtained from the Kansas Experiment Station, Manhattan, Kan. These publications will furnish excellent material from which to assign lists of readings.
7. The books and bulletins for reference should be taken from the library by the students only by permission from the teacher. If possible a separate case in the library should be provided for agricultural publications.
8. Subscribe for several of the best farm papers. Use these publications for assigned readings when they treat upon subjects under discussion.
9. If at any time assistance is needed write the State Agricultural College, Manhattan, Kan. All the assistance possible will be furnished.

Course of Study in Agriculture.

A.—INTRODUCTION.

- I.—Definition of agriculture.
 - II.—Divisions of agriculture.
 1. Crop growing.
 2. Live stock growing.
 3. Manufacture.
 - III.—Forces controlling plant and animal growth.
 1. Heredity.
 2. Environment.
- Literature:
1. "Elements of Agriculture," chapter I.

B.—SOILS.

I. Plant Food.

1. Elements required for plant growth.
2. Sources of plant food.
 - a. Air.
 - b. Water.
 - c. Soil.
3. Amounts of different elements in plants.
4. Elements likely to be deficient in soils.
5. Functions of different elements.
6. How the plant gets its food.
 - a. From the soil.
 - b. From the air.
7. Manufacture of food material in the plant.
8. Effect of time of harvesting on composition of the plant.

Laboratory exercises:

1. Percentage of water, dry matter and ash in plants. "A Unit in Agriculture," Ex. 46, p. 46.
2. Osmosis. "A Unit in Agriculture," Ex. 21, p. 40.
3. Root hairs. "Elements of Agriculture," Ex. 26, p. 73.
4. Examination of plants for starch and protein. "Elements of Agriculture," Ex. 28, 29, p. 73.
5. Plant food. "A Unit in Agriculture," Ex. 45, p. 45.

Literature:

1. "Elements of Agriculture," ch. IV.

II.—Soil, its physical nature.

1. Origin and formation of the soil.
2. Composition.
3. Classification of soils.
4. Soil temperature.
5. Soil water.
6. Irrigation.
7. Drainage.
8. Soil air.
9. Organic matter in the soil.
10. Life in the soil.

Laboratory exercises:

6. Study of soil. "A Unit in Agriculture," Ex. 13, 14, 15, pp. 35, 36.
7. Field lesson in soils. "A Unit in Agriculture," Ex. 16, p. 37.
8. Soil texture. "A Unit in Agriculture," Ex. 17, p. 37.
9. Temperature of soils. "A Unit in Agriculture," Ex. 18, p. 38.
10. Water capacity of soil. "A Unit in Agriculture," Ex. 19, p. 39.
11. Capillarity of soils. "A Unit in Agriculture," Ex. 20, p. 39.
12. Effects of excluding air from soil. "A Unit in Agriculture," Ex. 25, p. 41.
13. Soil temperature. "A Unit in Agriculture," Ex. 26, p. 42.
14. Soil drainage. "A Unit in Agriculture," Ex. 27, p. 42.
15. Evaporation from the soil. "Elements of Agriculture," Ex. 42, p. 106.

Literature:

1. "Elements of Agriculture," ch. V, pp. 75-108.
2. "The Soil," by F. H. King, chs. 1, 2, 5, 6, 8.
3. Management of soils to conserve moisture. Farmers' Bulletin No. 266.

III.—Soil Fertility.

1. Causes for decreased production of soils.
2. Materials used as fertilizers.
 - a. Nitrogen. (Fixation of nitrogen by legumes.)
 - b. Phosphorus.
 - c. Potash.
 - d. Lime.
 - e. Complete fertilizers.
3. Barnyard manure.
 - a. Value. (Factors influencing.)
 - b. Amount produced by farm animals.
 - c. Losses in manure.
 - d. Application of manure.
4. Green manuring.

Laboratory exercises:

16. Absorption of manure by soils and losses of manure. "Elements of Agriculture," Ex. 49, 50, p. 151.
17. Fertilizer trial (where land is available). "Elements of Agriculture," Ex. 52, p. 151.

Literature:

1. "Elements of Agriculture," ch. VI, pp. 109-153.
2. "The First Principles of Soil Fertility," by Alfred Vivian.

C.—PROPAGATION OF PLANTS.

I.—Propagation by Seeds.

1. Nature of seed.
2. Importance of vigorous germination.
 - a. Condition of germination. (Vitality of seed; moisture; heat; air.)
 - b. Germination affected by: Maturity; age; kind; extremes of temperature; extremes of moisture.
3. Seed analysis and valuation.
4. Germination tests.
5. Storage of seeds.

II.—Propagation Other Than by Seeds.

1. Spores.
2. Creeping stems and rootstocks.
3. Roots.
4. Tubers.
5. Cuttings.
6. Grafting.
7. Budding.
8. Root grafting.
9. Layering.

Laboratory exercises:

18. Absorption of water by seeds. "A Unit in Agriculture," Ex. 28, p. 43.
19. Effect of temperature upon seed germination. "A Unit of Agriculture," Ex. 29, p. 43.
20. Effect of air upon seed germination in water. "A Unit in Agriculture," Ex. 30, p. 43.
21. Effect of air upon seed germination in soil. "A Unit in Agriculture," Ex. 38, p. 45.
22. Relation of light to growth. "A Unit in Agriculture," Ex. 39, p. 45.
23. Relation of temperature to growth. "A Unit in Agriculture," Ex. 40, p. 45.
24. Purity of seeds. "A Unit in Agriculture," Ex. 31, p. 43.
25. Making a propagation bed. "A Unit in Agriculture," Ex. 32, p. 44.

I.—Propagation Other Than by Seeds—*continued*.

Laboratory exercises:

26. Cuttings. "A Unit in Agriculture," Ex. 33, p. 44.
27. Grafting. (Demonstration by teacher.) "A Unit in Agriculture," Ex. 34, p. 44.
28. Practice in grafting.
29. Budding. (Demonstration by teacher.) "A Unit in Agriculture," Ex. 35, p. 44.
30. Practice in budding.

Literature:

1. "Elements of Agriculture," ch. 3, pp. 36-59.
2. Farmers' Bulletin No. 157.

D.—FARM CROPS.

I.—Corn.

1. History and types.
2. A study of the corn plant.
3. A study of the corn kernel.
4. Selection, care and preparation of the seed.
5. Testing seed for germination.
6. Seed-bed, planting and cultivating.
7. Varieties and distribution.
 - a. Boone County White.
 - b. Reid's Yellow Dent.
 - c. Kansas Sunflower.
 - d. Hildreth.
 - e. Leaming.
 - f. Pride of Saline.
8. Methods of corn improvement.
 - a. Ear-to-row breeding plot.
9. Uses of corn.
 - a. Feed for live stock.
 - b. Human food.
 - c. Commercial products.

Laboratory exercises:

31. A grain of corn. "A Unit in Agriculture," Ex. 1, p. 27.
32. An ear of corn. "A Unit in Agriculture," Ex. 2, p. 27.
33. The corn plant. "A Unit in Agriculture," Ex. 3, p. 28.
34. Corn judging—single ear. "A Unit in Agriculture," Ex. 4, p. 29.
35. Corn judging—use of score card. "A Unit in Agriculture," Ex. 5, p. 30.
36. Corn judging—use of score card. "A Unit in Agriculture," Ex. 5, p. 30.
37. Testing seed corn for germination. "A Unit in Agriculture," Ex. 6, p. 33.
38. Depth to plant corn. "Elements of Agriculture," Ex. 54, p. 238.

Literature:

- "Elements of Agriculture," ch. VII, pp. 154-178.
 "A Corn Primer," by E. G. Schafer, Agricultural Education,
 vol. III, ch. V. Kansas State Agricultural College.
 "Cereals in America," by T. F. Hunt.
 "Corn," by Bowman and Crossley.

II.—Wheat.

1. Origin and importance.
2. Seed-bed preparation and sowing.
3. Selection of seed.
4. Marketing.
5. Wheat products and milling.

II.—Wheat—*continued*.

Laboratory exercises:

39. Study of a grain of wheat. "A Unit in Agriculture," Ex. 7, p. 33.
40. Study of a head of wheat. "A Unit in Agriculture," Ex. 8, p. 34.
41. The wheat plant. "A Unit of Agriculture," Ex. 9, p. 34.
42. A visit to a flour mill. "Elements of Agriculture," Ex. 55, p. 239.

Literature:

1. "Elements of Agriculture," ch. VII, pp. 178-181.
2. "A Wheat Primer," by L. A. Fitz, "Agricultural Education," vol. III, ch. VI. Kansas State Agricultural College.

III.—Small Grain Cereals Other Than Wheat.

1. Oats.
2. Barley.
3. Rye.
4. Rice.

Laboratory exercises:

43. Study of a head of oats. "A Unit in Agriculture," Ex. 10, p. 34.
44. Study of a head of barley. (Follow outline for study of a head of wheat.)
45. Study of a head of rye. (Follow outline for study of a head of wheat.)

Literature:

1. "Elements of Agriculture," ch. VII, pp. 181, 182.
2. Farmers' Bulletin No. 420. United States Department of Agriculture.
3. Farmers' Bulletin No. 443. United States Department of Agriculture.
4. "Cereals in America," by Thomas F. Hunt, chs. 18, 19, 20, 21, 22, 23.

IV.—Sorghums.

1. History and distribution.
2. Classification.
 - a. Saccharine. (Amber; orange.)
 - b. Non-saccharine. (1, *Durra*: Milo, Brown durra, Jerusalem corn. 2, *Kafir*: Red, White, Black-hulled White. 3, *Broom corn*: Standard, dwarf.)
3. Importance of sorghums.

Laboratory exercises:

46. A study of the sorghum head.
47. A study of the sorghum plant.

Literature:

1. Farmers' Bulletin No. 448. United States Department of Agriculture.
2. Bulletin No. 203, Bureau of Plant Industry, United States Department of Agriculture.
3. "Cereals in America," by T. F. Hunt, ch. 24.

V.—Perennial Grasses.

1. Character of perennial grasses.
2. Cultural methods.
3. Grasses for hay.
4. Grasses for pasture.
5. Varieties of grasses.
 - a. Timothy.
 - b. Redtop.
 - c. Meadow foxtail.

V.—Perennial Grasses—*continued*.

5. Varieties of grasses.
 - d. Kentucky blue grass.
 - e. Orchard grass.
 - f. Meadow fescue.
 - g. Brome grass.
 - h. Bermuda grass.

Laboratory exercises:

48. A study of grasses. (Follow outline for study of legumes.)
“A Unit of Agriculture,” Ex. 11, p. 34.

Literature:

1. “Elements of Agriculture,” ch. VII, pp. 170-188.
2. “The Forage and Fiber Crops in America,” by T. F. Hunt.

VI.—Legumes.

1. Clovers.
 - a. Red.
 - b. Alsike.
 - c. Crimson.
 - d. Mammoth.
 - e. Sweet.
 - f. White.
2. Alfalfa.
 - a. Distribution.
 - b. Culture and production.
3. Annual legumes.
 - a. Cowpeas.
 - b. Soy beans.
 - c. Field peas.

Laboratory exercises:

49. Study of legumes. “A Unit in Agriculture,” Ex. 11, p. 34.

Literature:

1. “Elements of Agriculture,” ch. VII, pp. 188-198.
2. “The Forage and Fiber Crops in America,” by T. F. Hunt.
3. Farmers’ Bulletin No. 339, United States Department of Agriculture.
4. Bulletin No. 160, Kansas Experiment Station.

VII.—Annual Forage Crops.

1. Millet.
2. Cereals.
 - a. Corn.
 - b. Wheat.
 - c. Oats, etc.

Literature:

1. Farmers’ Bulletins Nos. 69, 101 and 168. United States Department of Agriculture.

VIII.—Roots and Tubers.

1. Beets.
2. Rape.
3. Potatoes.

Laboratory exercises:

50. Study of the Irish potato. “A Unit in Agriculture,” Ex. 12, p. 35.

Literature:

1. “The Forage and Fiber Crops in America,” by T. F. Hunt.
2. Farmers’ Bulletins Nos. 25, 149, 244, 251, United States Department of Agriculture.

IX.—Fiber Crops.

1. Cotton.
 - a. Description and distribution.
 - b. Types.
 - c. Cultural methods.
 - d. Harvesting and marketing.
 - e. Manufacture and use.
2. Flax.
 - a. Cultural methods and use.

Literature:

1. "Elements of Agriculture," ch. VII, pp. 198-216.
2. "The Forage and Fiber Crops of America," by T. F. Hunt, chs. 16-23.

X.—The Wood Crop.

1. Forests of the United States.
2. Forests and climate.
3. Conservative lumbering.
4. The farm woodlot.
5. Trees to plant.

Laboratory exercises:

51. Farm forestry. "A Unit in Agriculture," Ex. 69, p. 63.

Literature:

1. "Elements of Agriculture," ch. VII, pp. 216-227.

XI.—Systems of Cropping.

1. Choice of crops.
2. Crop rotation.
 - a. Advantages.
 - b. Profits from.
3. Crop rotation and crop failures.
4. Examples of crop rotation.

Laboratory exercises:

52. Planning a cropping system. "Elements of Agriculture," Ex. 68, p. 280.

Literature:

1. "Elements of Agriculture," ch. IX, pp. 272-280.
2. "First Principles of Soil Fertility," by Alfred Vivian, ch. X.

E.—ORCHARD AND GARDEN CROPS.

I.—Orchards.

1. Locating the orchard.
2. Preparing the land.
3. Setting the trees.
4. After management.
 - a. Pruning.
 - b. Spraying.
 - c. Frost protection.
 - d. Thinning, picking, storing and marketing.
5. Varieties of fruit.
 - a. Pome fruits. (Apple; pear; quince, etc.)
 - b. Drupe or stone fruits. (Peach; plum—European, American, Japanese; cherry; apricot; grape.)
 - c. Bush fruits. (Raspberry, blackberry, etc.)

Laboratory exercises:

53. How to plant a tree. "Elements of Agriculture," Ex. 60, p. 241.

Literature:

1. "Elements of Agriculture," ch. VII, pp. 227-234.
2. "Popular Fruit Growing," by L. B. Green.

II.—Gardens.

1. Selection of garden spot.
2. Tillage operations.
3. Cold frames.
4. Hotbeds.
5. Vegetables to be grown.
 - a. Early, hardy. (Asparagus, rhubarb, beets, cabbage, carrots, cauliflower, celery, lettuce, onions, parsnips, early peas, radishes, potatoes.)
 - b. Late, tender. (Beans, corn, cucumbers, egg plant, muskmelons, peas, peppers, summer squash, tomatoes.)

Laboratory exercises:

54. The home garden. "A Unit in Agriculture," Ex. 68, p. 63.

Literature:

1. "Elements of Agriculture," ch. VII, pp. 234-237.
2. "Vegetable Gardening," by L. B. Green.

F.—ENEMIES OF PLANTS.

I.—Weeds.

1. Control.

II.—Bacterial Diseases.

1. Character.
2. Examples.
3. Treatment.

III.—Fungous Diseases.

1. Character.
2. Examples.
3. Treatment.

IV.—Parasitic Plants.

1. Dodder.

V.—Insects.

1. Biting insects, as potato beetle.
2. Sucking insects, as chinch bugs.

VI.—Spraying to Control Insects and Diseases.

1. Fungicide.
2. Poisons for biting insects.
3. Contact remedies for sucking insects.

Laboratory exercises:

55. Bacteria and molds. "A Unit in Agriculture," Ex. 47, p. 46.
56. Preparation of Bordeaux mixture. "A Unit in Agriculture," Ex. 48, p. 47.
57. Making an insect net. "A Unit in Agriculture," Ex. 49, p. 48.
58. Making a killing bottle, insect box and spreading board. "A Unit in Agriculture," Ex. 50, 51, 52, pp. 48, 49.
59. Killing and mounting insects. "A Unit in Agriculture," Ex. 53, p. 49.

Literature:

1. "Elements of Agriculture," ch. VIII, pp. 244-271.

G.—ANIMAL HUSBANDRY.

I.—Feeds.

1. Composition of feeds.
 - a. Water.
 - b. Ash.
 - c. Protein.
 - d. Fat.
 - e. Crude fiber.
 - f. Nitrogen-free extract.

I.—Feeds—*continued*.

2. Functions of the different food materials.
3. Digestibility of feeds.
4. Use of food.
 - a. Maintenance.
 - b. External work.
 - c. Production.
5. Comparison of concentrates and roughage.
6. Balanced rations.
7. Computing rations.
8. Condimental foods.

Laboratory exercises:

60. Computing rations. "Elements of Agriculture," questions and problems, pp. 288-299.

Literature:

1. "Elements of Agriculture," ch. X, pp. 281-299.
2. "Feeds and Feeding," by W. A. Henry.

II.—The Horse.

1. Origin and brief history.
2. Types.
 - a. Speed.
 - b. Draft.
3. Breeds of horses.
4. Care of horses.

Laboratory exercises:

61. Judging the draft horse by score card. "A Unit in Agriculture," Ex. 57, pp. 51, 52.
62. Judging the light horse by score card. "A Unit in Agriculture," Ex. 58, pp. 53, 59.

Literature:

1. "Elements of Agriculture," ch. XI, pp. 301-321.
2. "Types and Breeds of Farm Animals," by C. S. Plumb, pp. 1-166.

III.—Cattle.

1. Origin and history.
2. Types.
 - a. Beef.
3. Breeds.
 - a. Beef—Shorthorn, Hereford, Aberdeen Angus, etc.
 - b. Dairy—Jersey, Holstein, Friesian, Ayrshire, etc.
 - c. Dual purpose—Shorthorn (milking strains), Devon, Red Polled.
4. Cattle products.
 - a. Milk. Composition; commercial forms; Babcock test.
 - b. Dairy records.
5. Diseases of cattle.

Laboratory exercises:

63. Study of the cuts of beef. "A Unit in Agriculture," Ex. 54, p. 49.
64. Judging of beef cattle by score card. "A Unit in Agriculture," Ex. 59, pp. 55, 56.
65. Judging of dairy cattle by score card. "A Unit in Agriculture," Ex. 60, pp. 57, 58.
66. The Babcock test for butter fat in milk. "A Unit in Agriculture," Ex. 71, pp. 63, 64. "Elements of Agriculture," Ex. 74, pp. 345-347.

Literature:

1. "Elements of Agriculture," ch. VII, pp. 325-350.
2. "Types and Breeds of Farm Animals," by C. S. Plumb, pp. 175-332.

IV.—Sheep.

1. Types.
 - a. Fine wooled—Merino, Rambouillet, Delaine, etc.
 - b. Middle wooled—Southdown, Shropshire, Hampshire, etc.
 - c. Long wooled—Cheviot, Cotswold, Leicester, etc.
 2. Care of sheep.
- Laboratory exercises:
67. Judging of sheep by score card. "A Unit in Agriculture," Ex. 61, pp. 59, 60.

Literature:

1. "Elements of Agriculture," ch. XIII, pp. 351-356.
2. "Types and Breeds of Farm Animals," by C. S. Plumb, pp. 333-454.

V.—Swine.

1. History and distribution.
 2. Breeds.
 3. Care.
 4. Diseases.
- Laboratory exercises:
68. Judging of swine by score card. "A Unit in Agriculture," Ex. 62, p. 61.

Literature:

1. "Elements of Agriculture," ch. XIV, pp. 357-361.
2. "Types and Breeds of Farm Animals," by C. S. Plumb, pp. 467-554.

VI.—Poultry—Chickens.

1. Types and breeds.
 - a. Meat breeds—Brahma, Cochin, Langshan.
 - b. General purpose breeds—Plymouth Rock, Wyandotte, Rhode Island Red.
 - c. Egg breeds—Leghorn, Minorca, Black Spanish.
 - d. Ornamental breeds—Polish, Game, Bantam.
2. Care of poultry.
 - a. Feeding.
 - b. The incubator.
 - c. Poultry houses.

Laboratory exercises:

69. Study of an egg. "A Unit in Agriculture," Ex. 55, pp. 49, 50. "Elements of Agriculture," Ex. 79, pp. 368-371.
70. Poultry houses. "A Unit in Agriculture," Ex. 56, p. 50.

Literature:

1. "Elements of Agriculture," ch. XV, pp. 362-371.
2. Farmers' Bulletin No. 287, United States Department of Agriculture.

H.—FARM MANAGEMENT.

I.—The Choice of a Farm.

1. Size of farm.
2. Location.
3. Topography.
4. Soils.
5. Environment.
6. Improvements.
7. Working capital.

II.—Farm Records and Accounts.

1. Methods.

III.—The Farm House, or Dwelling.

1. Location.
2. Character.
3. Arrangement, etc.

IV.—Other Farm Buildings.

1. Number.
2. Location.
3. Purpose, etc.

V.—The Farm Community.

1. Agricultural societies.
 - a. Horticultural society.
 - b. Grange.
 - c. Farmers' institute.
2. The country school.
3. The country church.

Laboratory exercises:

71. Plan of farm. "A Unit in Agriculture," Ex. 63, p. 62.
72. Plan of home. "A Unit in Agriculture," Ex. 64, p. 62.
73. Plan of barn. "A Unit in Agriculture," Ex. 65, p. 62.
74. A farm problem. "Elements of Agriculture," Ex. 84, p. 387.

Literature:

1. "Elements of Agriculture," chs. XVI, XVII, XVIII, pp 372-399.
2. "Farm Management," by F. W. Card.

Agricultural Text and Reference Books.

LIST OF PUBLISHERS.

1. The Macmillan Company, Chicago.
2. Ginn & Company, Chicago.
3. Orange Judd Company, New York City.
4. American Book Company, Chicago.
5. University of Wisconsin, Madison, Wis.
6. Century Publishing Co., New York City.
7. Steiner Publishing Company, Toledo, Ohio.
8. D. C. Heath & Co., Chicago.
9. Webb Publishing Company, St. Paul, Minn.
10. John Wiley & Sons, New York City.
11. J. B. Lippincott Company, Philadelphia, Pa.
12. Doubleday, Page & Company, New York City.
13. Home Correspondence School, Springfield, Mass.
14. H. W. Mumford, Urbana, Ill.
15. Sanders Publishing Company, Chicago, Ill.
16. D. Appleton Company, Chicago, Ill.
17. F. H. King, University avenue, Madison, Wis.
18. Kenyon Publishing Company, Des Moines, Iowa.
19. E. P. Dutton & Co., Chicago, Ill.
20. Row, Peterson & Co., 623 S. Wabash avenue, Chicago, Ill.
21. A. C. McClurg & Co., Chicago, Ill.
22. Charities Publication Committee, 105 East Twenty-second street, New York City.
23. Howard R. Smith, Lincoln, Neb.

SOILS AND CROPS.

Figures following the titles refer to publishers given in preceding list.

Author, Title, Publisher, and Price.

- McDonald, "Dry Farming," 6. \$1.20.
 Roberts, "Fertility of the Land," 1. \$1.25.
 Burkett, "Soils," 3. \$1.25.
 Voorhees, "Fertilizers," 1. \$1.25.
 Hall, "The Soil," 19. \$1.50.
 Snyder, "Soils and Fertilizers," 1. \$1.25.
 King, "Irrigation and Drainage," 1. \$1.50.
 Lyon and Fippin, "Principles of Soil Management," 1. \$1.75.
 Elliott, "Practical Farm Drainage," 10. \$1.50.
 Widtsoë, "Dry Farming," 1. \$1.50.

- Fletcher, "Soils," 12. \$2.00.
 Hall, "Book of Rothamsted Experiments," 19. \$3.50.
 Hilgard, "Soils," 1. \$4.00.
 Stevenson and Schaub, "Soil Physics Laboratory Guide," 3. 50 cents.
 McCall, "The Physical Properties of Soils," 3. 50 cents.
 King, "Physics of Agriculture," 17. \$1.75.
 Spillman, "Farm Grasses in the United States," 3. \$1.00.
 Shaw, "Soiling Crops and the Silo," 3. \$1.50.
 Lyon and Montgomery, "Examining and Grading Grains," 2. 60 cents.
 Coburn, "Alfalfa," 3. \$2.00.
 Wing, "Alfalfa in America," 15. \$2.00.
 Myrick, "Book of Corn," 3. \$1.50.
 Dondlinger, "Book of Wheat," 3. \$2.00.
 Frazer, "The Potato," 3. 75 cents.
 Weed, "Farm Friends and Farm Foes," 8. 90 cents.
 Shamel, "Manual of Corn Judging," 3. 50 cents.
 Shoemsmith, "Study of Corn," 3. 50 cents.
 Shaw, "Clovers," 3. \$1.00.
 Shaw, "Forage Crops Other Than Grasses," 3. \$1.00.
 Shaw, "Grasses," 9. \$1.50.
 Voorhees, "Forage Crops," 1. \$1.50.
 Wilkinson, "Study of the Cotton Plant," 16. 35 cents.
 Burkett, "Farm Crops," 3. \$1.50.

ORCHARDING AND GARDENING.

- Goff, "Principles of Plant Culture," 5. \$1.00.
 Bailey, "The Forcing Book," 1. \$1.25.
 Waugh, "The American Apple Orchard," 3. \$1.00.
 Duggar, "Fungous Diseases of Plants," 2. \$2.00.
 Bailey, "Nursing Book," 1. \$1.50.
 Bailey, "Garden Making," \$1.00.
 Bailey, "Principles of Fruit Growing," 1. \$1.50.
 Bailey, "Pruning Book," 1. \$1.50.
 Greene, "Among School Gardens," 22. \$1.25.
 Card, "Bush Fruits," 1. \$1.50.
 Rawson, "Success in Market Gardening," 12. \$1.10.
 Bailey, "Principles of Vegetable Gardening," 1. \$1.25.
 Brunett, "The Vegetable Garden," 12. \$1.50.
 Bailey, "Plant Breeding," 1. \$1.25.
 Brunett, "The Flower Garden," 12. \$1.50.
 Bailey, "Manual of Gardening," 1. \$2.00.
 Lodeman, "Spraying of Plants," 1. \$1.25.
 Stevens and Hall, "Diseases and Economic Plants," 1. \$2.00.
 Conn, "Bacteria Yeasts and Molds in the Home," 2. 60 cents.
 Lipman, "Bacteria in Relation to Country Life," 1. \$1.50.

ANIMAL HUSBANDRY.

Author, Title, Publisher, and Price.

- Roberts, "The Horse," 1. \$1.25.
 Johnston, "The Horse Book," 15. \$1.00.
 Mumford, "Beef Production," 14. \$1.50.
 Shaw, "Management and Feeding of Cattle," 3. \$2.00.
 Coburn, "Swine in America," 3. \$2.50.
 Craig, "Diseases of Swine," 3. 75 cents.
 Wing, "Sheep Farming in America," 15. \$1.00.
 Craig, "Judging Live Stock," 18. \$1.50.
 Wilcox, "Farm Animals," 12. \$2.00.
 Shaw, "Animal Breeding," 3. \$1.50.
 Salmon, "Diseases of Poultry," 3. 50 cents.
 Robinson, "Poultry Craft," 3. \$1.50.
 Valentine, "How to Keep Hens for Profit," 1. \$1.50.
 Mayo, "Diseases of Animals," 1. \$1.50.

- Davenport, "Domesticated Animals and Plants," 2. \$1.25.
 Comstock, "How to Keep Bees," 12. \$1.00.
 Comstock, "Insect Life," 16. \$1.50.
 Smith, "Our Insect Friends and Enemies," 11. \$1.50.
 Jordan, "Feeding of Animals," 1. \$1.50.
 Shaw, "Feeding of Farm Animals," 3. \$2.00.
 Wing, "Milk and Its Products," 1. \$1.50.
 Greeley, "The Farm Dairy," 15. \$1.00.
 Farrington and Woll, "Testing Milk and Its Products," 1. \$1.00.
 Lane, "The Business of Dairying," 3. \$1.25.
 Smith, "Profitable Stock Feeding," 23. \$1.50.

FARM MANAGEMENT.

- Hunt, "How to Choose a Farm," 1. \$1.75.
 Roberts, "Farmers' Business Handbook," 1. \$1.25.
 Steiner, "How to Keep Farm Accounts," 7. \$2.00.
 Roberts, "The Farmstead," 1. \$1.50.
 King, "Ventilation," 17. 75 cents.
 Davidson and Chase, "Farm Machinery and Farm Motors," 3. \$2.00.
 Warren and Livermore, "Laboratory Exercises in Farm Management," 1. 80 cents.

MISCELLANEOUS.

- Brooks, "Agriculture," 3 volumes, 13. About \$5.00.
 Burkett, Stevens and Hill, "Agriculture for Beginners," 2. 75 cents.
 Goodrich, "First Book of Farming," 12. \$1.00.
 Jackson and Dougherty, "Agriculture Through the Laboratory and School Garden," 3. \$1.50.
 McLeman, "Manual of Practical Farming," 1. \$1.50.
 Wilkinson, "Practical Agriculture," 4. \$1.00.
 Bailey, "Principles of Agriculture," 1. \$1.25.
 Davis, "Rural School Agriculture," 3. \$1.00.
 Duggar, "Agriculture for Southern Schools," 1. 75 cents.
 Hatch and Hazelwood, "Elementary Agriculture," 20. 60 cents.
 Goff and Mayne, "First Principles of Agriculture," 4. 80 cents.
 Massey, "Practical Farming," 21. \$1.50.
 King, "The Physics of Agriculture," 17. \$1.75.
 Bailey, "Cyclopedia of American Agriculture," 4 volumes, 1. \$20.00.
 Hatch and Hazelwood, "Elementary Agriculture," 20. 50 cents.
 Bricker, "The Teaching of Agriculture in High Schools," 1. \$1.00.

RELIABLE DEALERS IN APPARATUS.

Chemical apparatus and glassware:

- E. H. Sargent & Co., Chicago.
 Eimer & Amend, New York City.
 Bausch & Lomb Optical Co., Rochester, N. Y.
 Woldenberg & Schaar, 623 S. Wabash avenue, Chicago.
 Henry Heil Chemical Co., St. Louis.

General physical and agricultural supplies:

- Central Scientific Co., Chicago.
 E. H. Stoelting Co., Chicago.
 Henry Heil Chemical Co., St. Louis.
 W. M. Welch Mfg. Co., Chicago.
 Knott Apparatus Co., Boston.

Dairy laboratory supplies:

- A. H. Barber Co., Chicago.
 Creamery Coöperative Supply Co., Milwaukee, Wis.
 The Creamery Package Mfg. Co., Kansas City, Mo.

ANCIENT HISTORY.

INTRODUCTION.

I.—Prehistoric period

1. Origin of man.
2. Stages of civilization and characteristics of each.
3. Races.
4. Languages.

EASTERN OR ORIENTAL NATIONS.

I.—Nile valley—Egypt.

1. The land and the people.
 - a. Map drill.
 - b. Leading physical features and their effect on the development of the history and civilization of the country.
 - c. Inhabitants.
2. Political history.
 - a. The Old Empire.
 - b. The Middle Empire.
 - c. The Hyksos rule.
 - d. The New Empire.
 - e. Foreign rule.
3. Civilization.
 - a. Classes, occupations and mode of life.
 - b. Religious beliefs.
 - c. Art, science and literature.
4. Contributions to world civilization.

II.—Tigris and Euphrates valley—Babylonia, Assyria, and Chaldea.

1. The land and the people.
 - a. Map drill.
 - b. Leading physical features and their effect on the history and civilization of the country.
 - c. Inhabitants.
2. Political history.
 - a. Early Babylonian Empire: Age of the city-states; age of the empire.
 - b. Assyrian Empire: History preceding her supremacy; First Empire; Second Empire.
 - c. Later Babylonian Empire: Condition during Assyrian rule; during Babylonian supremacy; conquest by Persia.
3. Civilization.
 - a. Classes, occupations and mode of life.
 - b. Religious beliefs.
 - c. Art, science and literature.
 - d. Laws.
4. Contributions to world civilization.

III.—Middle or Syrian states—Hebrews and Phœnicians.

1. Hebrews.
 - a. The people.
 - b. Political history: Period of the Patriarchs; period of the Judges; period of the Kings; period of the Division; period of the Captivities.
 - c. Civilization; religion and literature.
 - d. Contributions to world civilization.
2. Phœnicians.
 - a. The land and the people: Influence of geography upon their history and civilization; origin and character of the inhabitants.

III.—Middle or Syrian states—Hebrews and Phœnicians—*continued*.

2. Phœnicians.
 - b. Political history: During the domination of Sidon and Tyre; during foreign rule.
 - c. Commerce and colonization.
 - d. Influence on world civilization.

IV.—Persia.

1. The land and the people.
2. Political history.
 - a. During Median rule.
 - b. During Persian independence: Building up the Persian Empire; organization of the Persian Empire.
3. Civilization.
 - a. Religion.
 - b. Art and literature.
4. Contributions to world civilization.

V.—Summary.

1. Manner and extent of the successive Oriental empires.
2. General features of Oriental civilization.
3. Comparison of the Nile and Euphrates civilization.
4. Blending of these.
5. Transmission to the West.

In the study of the Oriental nations emphasis should be placed upon the characteristic civilization of the several countries and their influence upon world civilization rather than upon their political development.

Supplementary reading. In place of requiring supplementary reading on this period, better results may be attained through informal talks by the teacher. In these, attention should be given to present-day archaeological research in these countries, the religious beliefs, art, and literature.

Maps. Early centers of civilization; Egyptian Empire at its greatest extent; Assyrian Empire at its greatest extent; Median and Latin Babylonian Empire; Persian Empire at its greatest extent.

Notebook. Outlines, parallel chronological tables, notes on the talks of the teacher.

WESTERN OR CLASSICAL NATIONS.

I.—Greece.

1. The land and the people.
 - a. Map drill.
 - b. Principal physical features and their influence on the history and civilization of the country.
 - c. Political division.
 - d. Inhabitants.
2. Periods.
 - a. Beginnings of the Greeks—the Epic or Heroic Age (to about 700 B. C.): Sources of information; divisions; chief events; institutions; religion; culture; summary—the inheritance of the historic Greeks.
In connection with this period some time should be spent on Greek mythology.
 - b. Formation period (to 479 B. C.).
 1. History: Development of Greek institutions; governments; colonization; states—Sparta, Athens. Growth of national unity: Influence of religion; influence of literature; influence of the Græco-Persian War.
 2. Culture: Art, literature, philosophy.

I.—Greece—*continued*.

2. Periods.

- c. Period of greatest intellectual and political activity
—Athenian supremacy (479 to 431 B. C.).
 - 1. General characters of the period. Events. Conditions prevailing during the age of Pericles: Material strength; political development; intellectual advancement; artistic development.
- d. Period of civil wars and decline of the city-state (431-338 B. C.).
 - 1. History: Peloponnesian War; Spartan supremacy; war between Sparta and Thebes; Theban supremacy.
 - 2. Culture: Art, literature, philosophy.
- e. Hellenistic period—Macedonian supremacy to the subjugation by Rome (338-146 B. C.).
 - 1. History: Macedonia; Phillip and his achievements; Alexander and his conquests; fate of Alexander's empire; history of each division; conquest by Rome.
 - 2. Culture: Art, literature, philosophy, science.

Supplementary reading. A limited amount should be required of the pupils. Among the topics that may be suggested are: Greek mythology; The religious beliefs of the Greeks; Private life of the Greeks; Greek literature; Greek art; Life of Pericles; Life of Alexander.

The following reference books will be found helpful for the foregoing subjects: Bulfinch, *Age of Fable* (Tilton, Boston); Gueber, *Myths of Greece and Rome* (American Book Co., Chicago); Seeman, *The Mythology of Greece and Rome* (Ward, London); Gulick, *Life of the Ancient Greeks* (Appleton, New York); Tucker, *Life in Ancient Athens* (Macmillan, New York); Hopkins, *Outlines of Art History*, vol. I (Educational Publishing Co., Boston); Tarbell, *History of Greek Art* (Flood, Meadville, Pa.); Gardner, *Greek Sculpture* (Macmillan, New York); Abbott, *Pericles* (Putnam, New York); Grant, *Pericles* (Murray, Lincoln); Wheeler, *Life of Alexander the Great* (Putnam, New York); Dodge, *Alexander* (Houghton, Boston).

Extracts from the works of leading Greek writers: Plutarch (Macmillan, New York); Fling, *Source Book of Greek History* (Heath, Boston).

Maps. 1. Prepared in advance: Geographical map of Greece; Greek Colonies; Græco-Persian wars; City of Athens; Delian and Dorian Leagues; Alexander's Empire; Divisions of Alexander's empire.

2. Constructed in class: Individual outline desk maps. These may be prepared during the progress of the recitation to illustrate the lesson.

Blackboard outline maps should also be made.

Notebook. Outlines, comparisons, diagrams, and chronological tables; notes on talks given in class; reading notes.

II.—Rome.

- 1. The land and the people.
 - a. Map drill.
 - b. Principal physical features and their effect on the history and civilization of the country.
 - c. Political divisions.
 - d. Inhabitants.
- 2. History.
 - a. Making of Rome—Regal Rome (to about 500 B. C.): Sources of information; legends concerning the period; probable events; institutions.

II.—Rome—*continued*.

2. History.

b. Rome's Western Empire—The Early Republic (500 [?]-200 B. C.).

1. Rome's defense against her neighbors: Internal affairs—the new government established; the struggle between the two classes. External affairs.
2. Union of Italy under Rome: External affairs—conquest of Italy. Internal affairs. Sum up the political, military and social conditions in Rome.
3. Rome's struggle with Carthage for the Western Mediterranean: Events—First Punic War; events between the First and Second Punic Wars; Second Punic War.

c. Rome's Eastern Empire—the Latin Republic (200-30 B. C.).

1. Period of Conquest: Wars—in the East; in the West. Effect of the wars—on the government; on the life and culture of the Romans.
2. Period of Revolution—the change from the republic to the monarchy: Preliminary survey—conditions existing in the Roman world. First phase—times of the Gracchi; Times of Marius and Sulla. Second phase—times of Pompey and Cæsar; times of Anthony and Octavius.

d. Rome's World Empire—Imperial Rome (31 B. C. to 800 A. D.).

1. Under the Principate: First Century (31 B. C. to 69 A. D.)—Julian emperors; emperors of the revolution year. Second Century—the Golden Age of Imperialism (69-192 A. D.)—Flavian emperors; Antonine emperors. Third Century (192-284 A. D.)—Barrack emperors.

After studying the principal events of these three centuries, sum them up as to (1) political development and administration of the government; (2) boundaries and frontier defense; (3) economic and social conditions; (4) Christianity; (5) literature and art.

2. Under Despotism (284-376 A. D.): Fourth Century—reforms in government and triumph of Christianity; emperors; leading events.
3. The Break-up—the transition period from ancient to medieval history: Barbarian invasion (376-476 A. D.)—the Germans; the leading invasions; the last Roman emperor in the West; causes of the decline of Rome.
4. Establishment of the German kingdoms and the blending of the elements (476-800 A. D.)

Supplementary reading. The following topics are suggested: Legends of Early Rome; Twelve Tables; Roman Constitution; Life of Hannibal; Life of Cæsar; Life of Cicero; Private Life of the Romans; the City of

Rome and the Roman Forum. Source reading may well be used to vitalize the work.

The following reference books will be found helpful:

Source accounts: Plutarch (Macmillan, New York); Botsford, *Story of Rome as the Greeks and Romans Tell It* (Macmillan, New York); Munro, *Source Book* (Heath, Boston); Fling, *European History Studies* (Ainsworth & Co., Chicago); Laing, *Masterpieces of Latin Literature*.

Brief accounts: Textbooks by Goodspeed, West, Wolfson, Morey, Myers, Botsford, How and Leigh, Pelham.

Larger accounts: Dodge, *Hannibal* (Houghton, Boston); Morris, *Hannibal* (Putnam, New York); Fowler, *Cæsar* (Putnam, New York); Fronde, *Cæsar* (Scribner, New York); Forsythe, *Cicero* (Scribner, New York); Davidson, *Cicero* (Putnam, New York); Abbott, *Roman Political Institutions* (Ginn, Boston); Johnston, *Private Life of the Romans* (Scott, Foresman & Co., Chicago); Preston and Dodge, *Private Life of the Romans* (Leach, Boston); Huelson, *Roman Forum* (Loescher, Rome); Mann, *Pompeii, Its Life and Art* (Macmillan, New York).

Maps. Prepared in advance: Italy and Its Inhabitants; Conquest of Italy; Roman World after the First Punic War; Western Mediterranean at the Opening of the Second Punic War; Hannibal's March; Roman World after the Third Punic War; Imperial Rome; Roman World under Augustus, Claudius, and Trogan; Roman Empire under Constantine; the Division of the Roman Empire and the German Tribes; German Invasion.

Constructed in class: Individual outline desk maps. These may be prepared during the progress of the recitation to illustrate the lesson. At times this work may be substituted for maps usually prepared at home.

Blackboard outline maps. These, as occasion requires, are to be utilized by the pupils in the course of their oral recitations, to make clear the subject under discussion. Wall outline maps will be found to be of service, showing the growth of the Roman territory. As conquests are made they should be added by the pupils to the map.

Notebooks. Outlines; diagrams; comparisons; summaries; progressive outlines on such subjects as the Roman army, the Roman senate, Roman conquests; notes on talks by the teacher, and reading notes.

MEDIEVAL AND MODERN EUROPEAN HISTORY.

MEDIEVAL HISTORY.

I.—Transition period from ancient to medieval history—"Dark Ages" (396-800).

1. The West.

- a. Blending of the elements: (a) Classical, (b) German, (c) Christian. Sum up the conditions as to each at the opening of the period.
- b. Circumstances under which this blending took place. Establishment of the Germanic kingdoms. History of each to 768.
- c. The fusion.
- d. The church.

2. The East.

- a. Eastern Empire.
- b. Eastern or Greek Church.

3. The South.

- a. Mohammedan world.

Supplementary reading. Source reading may be used here to vitalize the work on such subjects as the Germans, the Huns, the early monks, the Koran, etc.

References: Pennsylvania Translations and Reprints from the Original Sources of European History (University of Pennsylvania); Robinson, Readings in European History, vol. I (Ginn, Boston); Jones, Civilization in the Middle Ages (Ainsworth & Co., Chicago); Lane-Poole, the Speeches and Table Talk of the Prophet Mohammed (Macmillan, New York); Kingley, The Hermits (Alden, New York).

Maps. The German Kingdoms; Empire of the East under Justinian; Saracen Empire.

Notebook. Outlines, notes on talks and readings, and a digest of the changes in the West, the East and the South.

II.—Medieval period.

1. Period of slow recovery.
 - a. Reign of Charles the Great.
 1. Kingdom of the Franks at the accession of Charles.
 2. The wars of Charles.
 3. The empire of Charles. Imperial coronation at Rome and its importance. Methods of government and administration used.
 4. Encouragement of learning.
 - b. New series of "Dark Ages."
 1. Break-up of the Carolingian Empire, and the formation of separate monarchies. New invasions: Norse—characteristics; raids and settlements; effect on European history.
 - c. Movements of the Normans.
 1. Into Italy and Sicily.
 2. Into England.
 - d. Feudalism.
 1. Definition.
 2. Elements.
 3. Relation of lord and vassal.
 4. Feudal society.
 5. Chivalry.
 - e. Empire and papacy to 1122.
 1. The medieval empire and the medieval church.
 2. Relation of one to the other.
 3. Struggle between, to 1122.
2. Crusades.
 - a. Comparison of the conditions existing in the East and in the West at the opening of the period.
 - b. Causes for.
 - c. Account of principal ones.
 - d. Results of.
3. Period of revival.
 - a. Empire and papacy, 1122-1450.
 1. Ascendancy of the papacy.
 2. Decline of the temporal power of the papacy.
 - b. Medieval society.
 1. Military classes.
 2. Monastic life.
 3. Peasant life.
 4. Medieval universities and learning.
 5. Commerce and the rise of the towns.
 - c. Growth of the nations. History of the separate states to the close of the Middle Ages.

Supplementary reading. Topics suggested for further investigation: Charles the Great; Feudalism; Crusades; Life of the Nobles; Peasant Life; Monasteries; Universities; Town Life; Joan of Arc.

If a separate course is not offered, special reading should be done in connection with English history.

Reference books that may be utilized:

Brief accounts: Robinson, History of Western Europe (Ginn, Boston); Munro, History of the Middle Ages (Appleton, N. Y.); Thatcher, Europe in the Middle Ages (Scribner, N. Y.); West, Modern History (Allyn & Bacon, Boston and Chicago); Myers, The Middle Ages (Ginn, Boston); Harding, Essentials of Medieval and Modern History; Cheyney, A Short History of England (Ginn, Boston); Harding, The Story of England; Terry, A History of England (Scott, Foresman & Co.); Gardiner, Students' History of England (Longmans, London); Green, Short History of the English People (American Book Co., Chicago).

Longer accounts: Davis, Charlemagne (Putnam, N. Y.); Hodgkin, Charles the Great (Macmillan, N. Y.); Russell, The Story of Charlemagne; Archer and Kingsford, The Crusades (Putnam, Boston); Cox, The Crusades (Longmans, N. Y.); Gray, The Children's Crusade (Houghton, Boston); Cheyney, Industrial and Social History of England (Macmillan, N. Y.); Compayre, Abelard and the Medieval Universities (Scribner, N. Y.); Cornish, Chivalry (Macmillan, N. Y.); Jessopp, Coming of the Friars (Putnam, Boston); Lowell, Joan of Arc (Houghton, Boston); Oliphant, Jeanne d' Arc (Putnam, Boston).

Source accounts: Pennsylvania Translations and Reprints from the Original Sources of European History (University of Pennsylvania); Robinson, Readings in European History, vol. I (Ginn, Boston); Jones, Civilization in the Middle Ages (Ainsworth & Co., Chicago); Eginhard, Charlemagne (American Book Co.); Colby, Selections from the Sources of English History (Longmans, London).

Reporting at regular intervals on current topics may be commenced in this term.

Maps. Prepared in advance: Empire of Charles the Great; Treaty of Verdun; Norse Raids and Settlements; Treaty of Wedmore; The Crusades; Medieval Trade Routes; German Empire; England and France 1154-1453; Spain 1300-1492; Italy at the Close of the Middle Ages; The Mongol Empire; The Empire of the Ottoman Turk; Europe 1492.

Constructed in class: Individual outline desk maps. These may be prepared during the progress of the recitation to illustrate the lesson. At times this work may be substituted for maps usually prepared at home.

Blackboard outline maps: These, as occasion requires, are to be utilized by the pupils in the course of their oral recitations to make clear the subject under discussion. Wall outline maps will be found to be of service for showing changes in the boundaries in the various European countries.

Notebook. Outlines, diagrams, comparisons, digests, notes on lectures and reading.

III.—Transition period from medieval to modern history—the Renaissance.

1. Development of the monarchical states.
2. Beginning of the Renaissance in Italy. Revival of art and learning.
3. Age of inventions and discoveries.
4. Reforming movements of the fifteenth century.

Maps. Early Voyages of Discovery and the Colonial Empires of the Sixteenth Century.

Notebooks. A summary of the learning and art of the Middle Ages and of the Renaissance period. Possibly pupils may gain a clearer idea of these subjects if the material is given to them in the form of informal

lectures by the teacher instead of the pupils being required to read it for themselves.

MODERN HISTORY.

I. Era of the Reformation and Religious Wars (1517-1648).

1. The Reformation.
 - a. The Lutheran Reformation in Germany to 1526.
 - b. Progress of the Reformation.
 1. In Germany: The Diets; war between Emperor Charles V and the Protestant princess; the Peace of Augsburg.
 2. In Europe: Among the northern countries; various Protestant sects; among the southern countries.
2. The Catholic reaction.
3. Spain in the Sixteenth Century—ascendency and decline.
 - a. Under Emperor Charles V.
 - b. Under Philip II.
 - c. Under Philip III.
4. England in the Sixteenth Century—the Tudor Period.
 - a. The New Monarchy.
 - b. The Reformation.
 1. Reign of Henry VIII, first step.
 2. Reign of Edward VI, second step.
 3. Reign of Mary, Catholic reaction.
 4. Reign of Elizabeth, settlement of the matter.
 - c. Foreign affairs.
 - d. Colonial enterprises.
 - e. Tudor England.
 1. Industrial and commercial progress.
 2. Social conditions.
 3. Literature and art.
5. Revolt of the Netherlands.
 - a. Cause.
 - b. Progress of.
 - c. Result.
6. France in the Sixteenth Century.
 - a. Attitude of the rulers toward the Reformation.
 - b. Civil and religious wars.
 - c. Reign of Henry VI.
 1. Edict of Nantes.
 2. Domestic policy of Henry and Sully.
 3. Foreign policy of Henry.
7. Thirty Years' War.
 - a. Nature and significance of.
 - b. Causes.
 - c. Periods.
 - d. Peace of Westphalia.

II. Era of the Political Revolution (1648 to present).

1. Period of Absolutism (1648-1789.)
 - a. Divine right theory of kingship.
 - b. France and the Age of Louis XIV.
 1. Establishment of the absolute monarchy; reign of Louis XIII; Richelieu and the absolute monarchy—internal policy, foreign policy.
 2. Reign of Louis XIV: Character, ability, ambition; his ideas of kingship and nature of his government; Louis XIV's wars; revocation of the Edict of Nantes; court life; literature and art; colonial policy; condition of France at the close of the reign.
 3. Decline as seen in the reign of Louis XV.

III. England during the Seventeenth Century—the Stuarts.

1. Reign of James I; beginning of the strife between the king and parliament.
2. Reign of Charles I; culmination of the strife.
3. The Great Rebellion: Result of the war; trial and execution of the King.
4. Puritan rule. The commonwealth: Under the rump parliament; under the protectorate.
5. Restoration: Reign of Charles II; reign of James II.
6. Revolution of 1688.
7. Reign of William and Mary. The triumph of the institutional monarchy.

IV. Formation and expansion of Russia.

1. Russia before Peter the Great.
2. Peter the Great.
 - a. Threefold task.
 - b. His achievements: Europeanizing of Russia; establishment of an absolute monarchy; expansion of Russia.
 - c. Importance to Russia.
3. Catherine the Great. Further expansion of Russia.

V. Rise and development of Prussia.

1. History of Brandenburg and Prussia to their union in 1618.
2. Prussia from 1618 to 1740.
3. Frederick the Great: Training, ability, attitude toward his people; his wars; reforms in Prussia; importance of his work to Prussia.

VI. Austria and Emperor Joseph II.

1. The Revolution (1789-1815).
 - a. French Revolution.
 1. Conditions in France on the eve of the Revolution.
 2. Louis XVI and attempts at reform.
 3. Progress of the Revolution: First period—constitutional monarchy—during the national assembly; during the legislative assembly. Second period—republic—during the national convention; during the directory.
 - b. Napoleonic Era.
 1. Consulate.
 2. Empire: To the treaty of Tilsit; to the revolt of the nations; to the battle of Waterloo.
 3. Napoleon's place in history.

VII. Period of readjustment (1815 to present).

1. Congress of Vienna.
2. Growth of nationality and democracy in—
 - a. France.
 - b. England.
 - c. Spain.
 - d. Portugal.
 - e. Italy.
 - f. Germany.
 - g. Austria-Hungary.
 - h. Russia.
 - i. Balkan States.
3. European colonial interests.
4. Other tendencies of the Nineteenth Century.

Supplementary reading: Source reading to vitalize the work should be continued. Since the biographical feature is strong throughout this period, pupils will enjoy reading on the lives of such persons as Luther,

Philip II, Mary Stuart, Elizabeth, Louis XIV, Oliver Cromwell, Peter the Great, Frederick the Great, Marie Antoinette, Napoleon, Gladstone, Bismarck. If a separate course in English history is not offered, reading should be done along this line. A definite time should be set aside at least once in two weeks for the discussion of current events.

References. Secondary accounts: Texts in medieval and modern history, and in English history; Heroes of the Nations series, and other standard biographies.

Source accounts: Pennsylvania Translations and Reprints from the Original Sources of European History (University of Pennsylvania); Robinson, Readings in European History, vol. II (Ginn, Boston); Colby, Selections from the Sources of English History (Longmans, London).

Maps. Prepared in advance: Empire of Charles V; Europe after the Treaty of Westphalia; Europe after the Treaty of Utrecht; Expansion of Russia; Development of Prussia; France at the Opening of the French Revolution; Empire of Napoleon; Congress of Vienna; Unification of Italy; Unification of Germany; Balkan States; Present Europe; Colonial Empires of the Nineteenth Century.

Constructed in class: Outline desk maps and outline blackboard maps may be used according to foregoing suggestions. The wall outline maps could be utilized to show the territorial growth of Russia, of Prussia, of Napoleon's empire, etc.

Notebooks. Outlines, diagrams, comparisons, parallel chronological tables, notes on lectures and reading.

ENGLISH HISTORY.

SUGGESTIONS TO TEACHERS FOR USING THE OUTLINE ON ENGLISH HISTORY.

In the preparation of the following outline on English history, only the salient points in the development of England have been considered. No attempt has been made to draw up an extensive outline, for the reason that one of such character would confuse rather than assist the average high-school student.

In using this outline instructors will find occasions for amplifying and extending it. This is as it should be, for each teacher should have opportunity to present the subject in the manner which, in his judgment, may seem the best. Some will prefer to lay special emphasis on one particular phase of English history, while another will desire to give more attention to a different period. Furthermore, teachers who by reason of press of time find themselves obliged to give but a brief course in English history will, it is hoped, find this outline suited to their respective needs as well.

In the presentment of this subject it is believed that additional interest will be aroused if the instructors will impress on the minds of their students the fact that a knowledge of English history is absolutely necessary to a thorough and complete understanding of their own country's history. A satisfactory knowledge of American colonial history is impossible unless one keeps in mind the English background. In like manner, the American revolutionary controversy becomes more intelligible when students recognize that the Americans in that struggle stood for the same principles that Hampden, Cromwell and others defended in the English civil war of the seventeenth century.

Map work should be especially emphasized. Let the student see by the aid of maps how the Anglo-Saxon kingdoms expanded little by little into the modern British Empire, which has been such an important factor in the progress of civilization. As to what particular maps should be assigned for class work, the instructor's judgment may be relied on to determine the suitable ones.

It is also suggested that readings from books or sources other than the text be assigned from time to time. The student should be required to present to the class the result of his investigation so all may profit by it. The value of reading outside the text lies in the fact that a view different from that of the text is obtained. This enables the student to consider the subject from several angles and gives him that which is absolutely necessary to an understanding of all history—a view point.

If by the use of this outline along the lines suggested above English history is made more interesting and vital, the object of its preparation will have been realized.

TEXTS.

The following texts will be found of value in the study of English history: Lecky, *The American Revolution*, Woodburn ed. (D. Appleton & Co.); Coman and Kindall, *History of England* (Macmillan Co.); Cheyney, *History of England* (Ginn & Co.); Terry, *History of England* (Scott, Foresman & Co.); Green, *A Short History of the English People* (American Book Co.); Hallam, *Constitutional History of England* (American Book Co.); Lecky, *History of England in the Eighteenth Century*; Cheyney, *Industrial and Social History of England* (Macmillan Co.)

Outline of English History.

- I. Ancient Britain (before 55 B. C.).
 1. Ages: Paleolithic; Neolithic; Bronze.
 2. People.
 3. Religion.
- II. Period of conquest (43-1066 A. D.).
 1. Conquest by the Romans, 43-410 A. D.
 - a. Military rule.
 - b. Effect of Roman occupation.
 2. Conquest by Anglo-Saxons, begun 449.
 - a. The "Heptarchy."
 - b. Celts against Teutons.
 - c. Christianity introduced, 597.
 - d. Overlordship of Wesser. Consolidation.
 3. Conquest by Danes, begun near the close of the eighth century.
 - a. Alfred the Great and the Danish struggle.
 - b. Progress of the Danish conquest.
 - c. Success of the Danes. Canute.
 - d. Restoration of the Saxon line: Edward the Confessor, 1042.
 - e. End of Saxon line: Death of Edward the Confessor, 1066.
 4. Norman conquest, 1066: Double invasion of England—at the north, Norway; at the south, Normandy.
- III. Government of England before 1066.
 1. National: King; Witan.
 2. Local: Shires; hundreds; townships.
- IV. England under the Norman kings (1066-1154).
 1. The feudal system as introduced by William: Contrast with Saxon feudalism.
 2. Government of England under the Norman kings.
 3. The Church of England during the Norman régime.
 4. Sovereigns of the Norman line.

V. England under the Plantagenets (1154-1485). From 1399 to 1485 the kings came from the Yorkist and Lancastrian branches of the Plantagenet family.

1. Judicial reforms.
2. The church and the Plantagenets.
3. Magna Charta, 1215.
4. Rise of the commons.
5. The beginning of the English parliament.
6. Expansion of England.
 - a. Conquest of Wales.
 - b. Struggle with Scotland: Result.
7. The Hundred Years' War, 1337-1453.
 - a. Causes.
 - b. Events.
 - c. Results.
8. Social and economic changes.
 - a. Decline of serfdom; cause.
 - b. Decline of feudalism.
9. Development of the English parliament.
10. Beginnings of English literature.
11. Wars of the Roses, 1455-1485.
 - a. Destruction of feudal nobility.
 - b. Downfall of feudalism as a political force.

VI. The Tudor dynasty (1485-1603).

1. Character of the new monarchy.
2. Decline of parliament; why?
3. The Protestant Reformation in England.
4. The Renaissance.
5. England and Spain. "The Invincible Armada."
6. Greatness of England at end of Tudor dynasty.

VII. The rule of the Stuarts (1603-1715).

1. Absolutism in church and state under James I. and Charles I.
2. The struggle between parliament and the Stuarts.
3. Overthrow of "arbitrary" government and establishment of "parliamentary" government.
 - a. The Puritan revolution, 1642-1649.
 - b. The "Glorious" revolution, 1688.
 - c. The "Bill of Rights," 1689.
4. Establishment of the English colonial empire.
5. Beginning of the second "Hundred Years' War," 1689-1815.
6. Consolidation of kingdoms of England and Scotland into the kingdom of Great Britain, 1707.
7. Beginnings of political parties.
 - a. Whigs.
 - b. Tories.

VIII. England under the Hanoverians (1715 to the present).

1. Development of the British "cabinet" and party government. Importance of the prime minister.
2. Duel between England and France for colonial empire.
3. The American Revolution: Causes; results.
4. England and the wars of the French Revolution and the Napoleonic Era.

VIII. England under the Hanoverians (1715 to the present)—*continued*.

5. The industrial revolution.
 - a. The change in manufacture.
 1. Effects on the laborers.
 2. Growth of cities.
 3. Rise of capitalism and unionism.
 - b. The agrarian revolution: Causes; results.
6. Political reforms.
 - a. The reform bills, 1832, 1867, 1884.
 1. Extension of the franchise.
 2. Democratic England.
 3. The constitution now: Position of crown, cabinet, house of lords, and house of commons.
 - b. Reform of the local government.
7. The life of the people; condition of laboring classes in cities and country.
8. Religion and philanthropy.
 - a. Religious conditions: The Wesley movement.
 - b. Social reforms: Prison; slavery.
9. England and the Eastern question.
 - a. The Near East: Turkey and Persia.
 - b. The Far East: Eastern Asia.
10. Ireland under the Hanoverians.
 - a. Catholic emancipation.
 - b. Economic reform.
 - c. Agitation for home rule.
11. The colonies.
 - a. The English in Australia, Africa, and the Western Hemisphere.
 - b. Progress of the idea of a federated British empire.

 AMERICAN HISTORY.

In the successful teaching of history the two most essential requisites on the part of the teacher are the ability to arouse the interest of the pupils and the faculty of leading them to see relations. And the following course of study, since it is intended primarily for the use of teachers, has been prepared with this thought in mind rather than with the view of including all topics that will necessarily be touched upon in a year's work in the subject. In other words, the outline is intended to be such a one as shall carry with it some thought of proper methods of teaching as well as serve as a guide for systematic study.

Beginning not later than the third grade, pupils should be introduced to the unconscious study of history through the medium of story and biography. This work should be continued through the fourth and fifth grades. It should be a *regular* part of the school curriculum and should be given *not less* than twice a week. This may be done in connection with the language work or, when opportunity offers, in connection with the reading lesson; *but it should be given*. It should constantly introduce new historic facts and incidents which by their nature and by the form in which they are presented will entertain and consequently interest the children. These stories are much better told than read, but occasionally may be read. They should invariably be reproduced either orally or in writing by the pupils, and the pupils should be encouraged to find out for themselves additional facts or similar incidents to relate.

All this necessarily presupposes the ability on the part of the teacher to tell stories. And no teacher is properly equipped to teach young chil-

dren until this ability has been developed. An excellent manual for this purpose is Bryant's *How to Tell Stories to Children*, published at one dollar by Houghton, Mifflin & Co., Chicago.

As sources of suitable material for the stories themselves the following are suggested:

	List price.
First Book of American History, Eggleston. American Book Co., Chicago, 60 cents.	
Stories of American Life and Adventure, Eggleston. Am. Book Co., Chicago, 50 "	
Great Americans for Little Americans, Eggleston. Am. Book Co., Chicago, 40 "	
Pioneer History Stories, McMurry. Macmillan Co., Chicago, 3 vols., each, 40 "	
American Pioneers, Mowry. Silver, Burdett & Co., Chicago..... 65 "	
American Leaders and Heroes, Gordy. Charles Scribner's Sons, Chicago.. 65 "	

After the completion of the story and reproduction work in the fifth grade some interesting and well-connected narrative primary history, such as McMaster's, should be taken up in the sixth grade. If the book selected be itself well written and be supplemented by additional oral matter the pupils should by the end of the year have acquired sufficient interest in, and insight into, their country's history satisfactorily to take up the formal study of the subject. But without such a foundation they will be utterly unprepared to do so.

For the satisfactory completion of the outline the following is submitted as the minimum list of reference books which should be available for the use of the pupils:

PEDAGOGICAL REFERENCE BOOKS.

	List price.
Report of Committee of Seven on History. The Macmillan Company, Chicago, \$0	50
The Teaching of History and Civics, Bourne. Longmans, Green & Co., Chicago, 1	50

HISTORICAL REFERENCE BOOKS.

	List price.
Student's History of United States, Channing. Macmillan Company, Chicago, \$1	40
Epochs of American History. Longmans, Green & Co., Chicago, 3 vols., each, 1	25
Discovery of America, Fiske. Houghton, Mifflin & Co., Chicago, 2 vols., each, 2	00
American Revolution, Fiske. Houghton, Mifflin & Co., Chicago, 2 vols., each, 2	00
The Critical Period, Fiske. Houghton, Mifflin & Co., Chicago, 1 vol.	2 00
Civil Government, Fiske. Houghton, Mifflin & Co., Chicago, 1 vol.	1 00
The Struggle for a Continent, Parkman. Little, Brown & Co., Boston.....	1 50
History of the Presidency, Stanwood. Houghton, Mifflin & Co., Chicago....	2 50
Bird's-eye View of Our Civil War, Dodge. Houghton, Mifflin & Co., Chicago..	1 00
American Politics, Johnson. Henry Holt & Co., New York.....	80
American History Series. Charles Scribner's Sons, Chicago, 7 vols., each....	1 00
Documentary Source-book of American History, Macdonald. Macmillan Company, Chicago	2 00

ADDITIONAL REFERENCE BOOKS.

Wherever it can possibly be done the following additional titles should also be procured:

	List price.
The Beginners of a Nation, Eggleston. D. Appleton & Co., Chicago.....	\$1 50
The American Revolution, Lecky (English view). D. Appleton & Co., Chicago, 1	00
Expansion of the American People, Sparks. Scott, Foresman & Co., Chicago, 2	00
Twenty Years of Congress, Blaine. Published by subscription, but may be gotten second-hand through dealers.	
History of the United States, Schouler. Dodd, Mead & Co., N. Y., 6 vols., ea.,	2 25
The United States in Our Own Time, Andrews. Charles Scribner's Sons, Chicago	5 00
American History as Told by Contemporaries, Hart. Macmillan Company, Chicago, 4 vols., each.....	1 75
How to Study and Teach History, Hinsdale. D. Appleton & Co., Chicago....	1 50
Guide to the Study of American History, Channing and Hart. Ginn & Co., Chicago	2 00
No. 17 Crane Classics, Blackmar. Crane & Co., Topeka (cloth).....	25
The Teaching of American History, McLaughlin. D. Appleton & Co., Chicago, Free.	

NOTE.—By submitting the entire list to several extensive dealers for quotations and stating that the books are for school library purposes a material reduction from the above prices may be obtained.

Outline of American History.

The topics here outlined should be thoroughly discussed in class, different authorities should be consulted on methods of teaching history, and the conclusions drawn should be kept constantly in mind.

1. Historical study.

- A. What it is—a study of the highest form of life activity.
- B. Why pursued in the schools.
 - 1. Information.
 - 2. Inspiration.
 - 3. Appreciation of duties and responsibilities.
 - 4. Awaken interest in historical reading and activities of men.
 - 5. Develop ability to judge and reason.
 - 6. Direct the development of the imagination.
 - 7. Gain knowledge of books and skill in handling them.
 - 8. Develop the ability to classify facts.
 - 9. Develop scientific habit of mind.
 - 10. Make the world better by avoiding repetition of the mistakes of the past.

2. Methods of historical study.

- A. In primary grades.
 - 1. Subject matter.
 - a. Character of.
 - b. How obtained.
 - c. How presented.
 - d. How used by pupils.
 - 2. What should be accomplished in—
 - a. Biography.
 - b. Anniversary celebrations.
 - c. Current history.
 - d. Historical reading and interest.
- B. In intermediate grades.
 - 1. Subject matter.
 - a. Character of.
 - b. How used.
 - c. How correlated.
 - d. Kinds that should not be used.
 - 2. Results to be secured in—
 - a. Information.
 - b. Reading habits.
 - c. Character of reading matter.
 - d. Formation of ideals.
 - e. Training for citizenship.
 - f. Attitude toward fellow pupils, the school, and the public.
- C. In grammar grades.
 - 1. The teacher.
 - a. Preparation.
 - b. Historical library.
 - c. His interest in present-day activities of the world at large.
 - 2. Subject matter.
 - a. Textbook.
 - b. Outline books.
 - c. Supplementary books.
 - d. Collateral reading.
 - e. Source books.
 - f. Secondary works. (Instructor should distinguish clearly between source books and secondary works, and point out examples of each in school library.)

2. Methods of historical study—*continued*.

C. In grammar grades.

2. Subject matter.

- g. Outline maps. (The Foster maps, by the Historical Publishing Company, Topeka, and the Ivanhoe maps, by Atkinson, Mentzer & Grover, Chicago, approved by State Textbook Commission.)

3. Manner of handling the subject.

a. Uses to be made of—

- 1. Written work.
- 2. Special reports in class.
- 3. Theme work on special topics for investigation.
- 4. Progressive map work.
- 5. Notebooks.

b. Relative advantages or disadvantages of outlines.
(Hall's Outlines, A. Flanagan & Co., Chicago, 30 cents, postpaid; approved by State Textbook Commission.)

- 1. Made entirely by the student.
- 2. Made to direct the student but to be completed by him. "Learning by doing."
- 3. Fully prepared.

c. Teacher and class.

- 1. Nature of questions asked.
- 2. Discussion of motives of characters studied.
- 3. Use of hypothetical questions in training to judge results, such as: Would the Mississippi valley have been settled as soon had the early explorers and settlers come to the Pacific instead of to the Atlantic coast of America? with reasons for answer.
- 4. Suitable texts, supplementary books, and reference works, for properly teaching United States history.

DISCOVERY AND EXPLORATION.

1. Relation between geography and history. (See Channing's Student's History of United States, or for still fuller treatment Brigham's Geographic Influences in American History, \$1.25, Ginn & Co., Chicago.)

- A. Temperature.
- B. Rainfall.
- C. Land configuration.
- D. Navigable rivers.
- E. Scientific discoveries and inventions.

2. The aborigines. (For this and discovery and naming of America, see especially Fiske's Discovery of America.)

- A. Origin.
- B. Relation to Mound Builders.
- C. Appearance, character, and manner of life.
- D. Number in 1492 and now.
- E. Name and location of chief tribes.

3. Pre-Columbian discoveries of America.

- A. The Northmen.
 - 1. When, where, and why.
 - 2. Proofs of their discovery.
 - 3. Importance.
- B. Other nations making claims.
 - 1. Evidence.
 - 2. Importance.

4. The discovery of America by Columbus.
 - A. Causes.
 1. Scientific—The Toscanelli letter and map. (This and following subtopics are intended as merely suggestive and not exhaustive.)
 2. Literary—the revival of learning.
 3. Commercial—the fall of Constantinople.
 4. Religious.
 5. Miscellaneous.
 - B. Christopher Columbus.
 1. Life and character.
 2. Voyages.
 - a. Number, purposes and result of each.
 - b. General results.
5. The naming of America.

(Show connection of following: Line of demarcation, Vasco de Gama, Cabral, Americus Vesputius, and Waldseemüller.)

 - A. Was the naming the result of deception and fraud, or was it the logical outcome of events?
6. Discoveries and explorations of Spanish, English, French, Portuguese, and Dutch. Give in regard to each—
 - A. Time.
 - B. Place.
 - C. By whom.
 - D. Conflicting claims to territory as a result.
7. Early attempts at settlement.
 - A. Where made.
 - B. By whom.
 - C. Why. (Compare those of different countries. Show the effect upon Spanish colonization, and upon Spain herself, of the easily gotten wealth she found in the new world.)
8. Effect of defeat of "Spanish Armada" upon settlement and later history of America.
9. Treatment of the Indians.
 - A. By the Spanish.
 - B. By the English.
 - C. By the French.
 - D. By the Dutch.
 - E. Results.

PERMANENT ENGLISH COLONIZATION.

1. Study each of the thirteen colonies by the following outline:
 - A. Name of colony.
 - B. Place settled.
 - C. Date of settlement.
 - D. Classes of colonists and leading persons.
 - E. Object of settlement.
 - F. Forms of government, local and in relation to the mother country.
 - G. Religion.
 - H. Education.
 - I. Important events in history of the colony.
2. Adaptability of colonists and country to each other in each of the thirteen colonies. (Have pupils notice wherein location influences development, as study progresses.)

3. Some topics worthy of special study in connection with early colonial history.
 - A. Boundary questions. (See Channing's Student's History, Thwaites' The Colonies, in Epochs of America History.)
 1. Virginia by charters of 1606, 1609, and 1612.
 2. Pennsylvania—Mason and Dixon line, extended how far west?
 3. Connecticut.
 4. Southern boundary of Maryland.
 - B. Forms of local government. (See Fiske's Civil Government, and Sloan's French War and the Revolution, chap. II, in American History series.)
 1. The country as a unit.
 - a. Where found.
 - b. Why.
 - c. Effect on later local and national government.
 2. The town as the unit.
 - a. Where found.
 - b. Why.
 - c. Effect on later local and national government.
 - C. Religious affairs. (See Sloan's French War and the Revolution, chap. II.)
 1. How regarded in each colony.
 2. Troubles:
 - a. With Roger Williams.
 - b. With Anne Hutchinson.
 - c. Salem witchcraft.
 - d. In Maryland—toleration act of 1649, and later troubles.
 - e. Gradual growth of toleration.
 - D. Notable failures and their causes.
 1. Communism.
 2. Locke's "Grand Model."
 3. Oglethorpe's philanthropy.
 - E. Introduction of slavery and representative government in Virginia, 1619.
 - F. "Fundamental Orders of Connecticut," 1639, the first real constitution in America.
 1. What provision of our present constitution comes from this Connecticut constitution of 1639?
 - G. United Colonies of New England, 1643—beginning of the principle of federation. (Every step in the development of this principle should be traced as study progresses.)
 - H. Indentured servants—"the poor whites."

THE STRUGGLE FOR A CONTINENT.

The instructor should show, and have the pupils verify so far as possible, that the first three intercolonial wars had their origin in European conditions—in the struggle of England and France for world supremacy—while the French and Indian War began in America over American conditions, though European considerations later became involved. The Medieval and Modern History of West, Myers, or any other good authority, will give the necessary facts.

1. Intercolonial wars previous to French and Indian War.
 - A. Cause of each.
 - B. Results in Europe as well as in America.
2. The French and Indian War.
 - A. Causes—remote and immediate—in Europe and America.
 - B. Events leading to the war:
 1. On part of English.
 2. On part of French.

2. The French and Indian War—*continued*.
 - C. The three most important strategic points (why?) and their capture—Fort Duquesne, Louisburg, and Quebec.
 - D. Minor events.
 - E. Results: For England, France, Spain, and the colonies. (A “turning point in the world’s history.” Why?)
 - F. The proclamation line of 1763—purpose and result. (See Foster’s History of the United States.)
 - G. Conditions in the Colonies, 1760-1770. (See Foster, Sloan, and Alice Morse Earle’s Home Life in Colonial Days, popular edition, 50 cents, Macmillan Company, Chicago.)
 1. Population—its distribution; composite character.
 2. Social life.
 3. Occupations.
 4. Education.
 5. Books and literature.
 6. Political life.

THE REVOLUTION.

1. Colonial policy of England. (In studying this topic the general European view of colonies should be investigated, the attitude of England toward her colonies should be compared with that of other countries, and—as always in the study of history—the spirit and conditions of the time should be considered.)
 - A. Before 1760.
 - B. After 1760, with reasons for change.
2. Navigation laws, and acts of trade.
 - A. Purpose of earlier acts.
 - B. Purpose of later acts.
 - C. Difficulties of enforcing.
 - D. Writs of assistance. (Compare with search warrants as authorized by our present constitution.)
 - E. Ideas of colonists as to legality of writs—actual legality.
 - F. Ideas of colonists as to legality of navigation acts—actual legality.
3. Ideas of representation and extent of right of suffrage. (See McLaughlin’s History of the American Nation, and Channing, and investigate the question of parliamentary reform in England. For the latter purpose any good English history will serve.)
 - A. British.
 - B. Colonial.
4. New attempts at colonial taxation.
 - A. Stamp act—reasons for; provisions; kinds of tax.
 1. Results—stamp-act congress—repeal.
 - B. Declaratory act.
 - C. Townshend acts (emphasize *all* of them); kind of tax; purpose for which to be used; changing attitude of colonists, and why.
 - D. Nonimportation agreement.
 - E. Boston massacre.
 - F. Committees of correspondence.
 - G. Boston tea party; changed attitude of colonists regarding taxation.
 - H. The five intolerable acts—name, provisions, and purpose of each.
5. Other causes of the Revolution.
 - A. “The Parson’s Cause”—Patrick Henry and his speeches.
 - B. The Gaspee affair.

5. Other causes of the Revolution—*continued*.
 - C. George III's desire to increase the power of the king at home—to "be king," as his mother advised.
6. First continental congress—composition; purpose; authority; acts.
 - A. Results.
7. Second continental congress.
 - A. Reason for.
 - B. Authority for or legality of.
 - C. How long in existence.
 - D. Most important acts.
 - E. Did it always prove efficient? with reason for answer.
8. Declaration of Independence.
9. Military events of the war. (After considering the preliminary battles fought before the declaration of independence, a very satisfactory method of studying the Revolution is by considering it from the three purposes of the British: first, the separation of New England from the rest of the colonies; second, the capture of the capital; third, "fraying" the colonies out on the edges. And in doing this the movements of Washington may be followed consecutively to the close of the war, and movements not directly connected with these may be considered in their bearing upon them. Fiske's American Revolution is both valuable and very interesting for this period.)
 - A. Movements of Washington.
 - B. Burgoyne's campaign—results in England, France and America.
 - C. Foreign aid.
 - D. The war in the South, and surrender of Yorktown.
 - E. The navy in the war. (See Channing for general view.)
 - F. Finances.
 - G. Other topics worthy of study.
 1. Hiring of German troops by British. In how far do these soldiers deserve the odium usually attached to the word "Hessian"? What became of most of them after the war?
 2. Work of George Rogers Clark. How connected with proclamation line of 1763, and Quebec act?
 3. Traitors—Benedict Arnold and Charles Lee. (See Fiske's American Revolution, especially concerning Lee.)
 4. The "Stars and Stripes."
 5. Why did America win?
 - H. The treaties of peace—preliminary, 1782; final, 1783. (The attitude of France and Spain, as well as of England and the colonies, should be clearly understood, and this will necessitate a full knowledge of the terms of the French alliance. It should be noted that England was willing to concede the colonies more than France or Spain was willing they should receive. For this topic and the entire period of the Confederation there is no book to be compared to Fiske's Critical Period.)
 1. Principal provisions.

THE CRITICAL PERIOD.

1. Review:
 - A. Fundamental orders of Connecticut, 1638-'39.
 - B. The New England confederation, or "United Colonies of New England."
 1. Colonies represented.
 2. Principle of representation adopted, and where found in the government to-day.
 - C. Albany plan of union.
 1. Main provisions.

1. Review—*continued*.

C. Albany plan of union.

2. Why rejected—

a. By England.

b. By the colonies.

D. Stamp-act congress.

E. First continental congress.

F. Second continental congress.

2. Articles of confederation. (Insist on reasons for calling this the "critical" period in American history.)

A. Main provisions.

B. Defects. (Discuss all, but especially lack of power to regulate commerce and to punish individuals.)

C. Attempts to amend—why unsuccessful.

D. Principle of representation.

3. The constitution.

A. Shays' rebellion—its significance.

B. The meeting at Alexandria, 1785—its cause and purpose.

C. The Annapolis trade convention, 1786—its cause and purpose.

D. The convention at Philadelphia, 1787—its cause and purpose.

E. The three great compromises:

1. Commerce, the slave trade, and an export tax.

2. Representation of the states—origin. (See Connecticut constitution of 1639.)

3. Slaves and apportionment of representation and direct taxes.

F. Sources of.

G. Ratification—grounds of opposition—the "Federalist." When?

H. Gladstone's tribute to the constitution, with some discussion of the justice of it.

I. The adoption of constitution a "peaceful revolution." Why?

ORGANIZATION OF THE GOVERNMENT AND FORMATION OF POLITICAL PARTIES.

1. Election of Washington; his inauguration date, and reason for change from date originally intended.

2. The cabinet—authority for and composition.

3. Hamilton's financial policy.

A. Reasons for.

B. Provisions.

C. Results.

4. Establishment of judiciary—authority for—composition of courts—jurisdiction.

5. Foreign affairs: Difficulties with—

A. Algiers.

B. Spain.

C. France. Was Washington's neutrality policy justifiable in view of French alliance during Revolution? Reasons for answer.

D. England.

6. Whisky insurrection: Cause—incidents—results.

7. Invention of the cotton gin; effects.

8. Development of parties—the United States bank—"strict construction" and "loose construction."

9. Election of 1796.

10. Other events.

ADMINISTRATION OF JOHN ADAMS: THE LAST OF THE FEDERALISTS.

1. The X. Y. Z. affair.

2. The alien and sedition laws—to what extent justifiable, and to what extent dangerous.

3. The Virginia and Kentucky resolutions. (These should be carefully studied, as to their cause, the reasoning upon which they were based, and the logical results to which they led. And intimate connection of all three of the preceding topics should be clearly brought out.)
4. The eleventh amendment—reason for; case of *Chisholm vs. Georgia*; wisdom of.
5. Minor events.

THE PERIOD OF ANTI-FEDERALIST, OR DEMOCRATIC-REPUBLICAN,
SUPREMACY.

1. Election of Jefferson by house of representatives.
 - A. Necessity for.
 - B. Incidents.
 - C. Results: twelfth amendment; on Burr; on Hamilton.
2. Louisiana purchase.
 - A. Why the United States wished to buy.
 - B. Why Napoleon was willing to sell.
 - C. The negotiations.
 - D. Constitutionality in view of Jefferson's "strict construction" ideas.
 - E. What was Louisiana as purchased? (It should be noted here and referred to later that the Florida-purchase treaty of 1819, and the rallying cry of "the *re*-annexation of Texas," are intimately connected with this question.)
3. Lewis and Clark expedition.
 - A. Object.
 - B. Route.
 - C. Results.
4. Hamilton-Burr duel—causes, especially the election of President in 1800, and of governor of New York in 1804.
5. The Burr conspiracy; his trial; his later life.
6. The Cumberland road.
 - A. How built.
 - B. Route.
 - C. Results.
 1. Economic.
 2. Political.
7. Jefferson and our foreign relations.
 - A. Affairs in Europe—war between France and England.
 1. British orders in council.
 2. Berlin decree.
 3. Second orders in council.
 4. Milan decree.
 5. Effect of these on American commerce.
 6. Impressment of American seamen; by whom; on what grounds.
 - B. Affairs in America: Jefferson's peace-at-any-price policy.
 1. Nonimportation act.
 2. Embargo act.
 3. Nonintercourse act.
 4. Macon bill No. 2; Napoleon's duplicity. Why did United States not fight France instead of England, or France as well as England?
8. Election of Madison; his efforts to avoid war; their failure.
9. War of 1812.
 - A. Causes in addition to those given above.
 - B. Chief events.
 - C. Results: Did the treaty of peace specifically determine them all?

10. The Hartford convention not as "black as it was painted"; explain.
11. The Algerine war; cause; result.
12. The first real protective tariff, 1816.
13. The second United States bank; chartered by "strict constructionists"; why?
14. Election of Monroe.
15. The "Era of Good Feeling." What? Why so called?
 - A. The Seminole war; cause.
 1. Jackson's expedition.
 - a. Arbuthnot-Ambrister affair.
 - b. Result as to England; as to Spain. Was Jackson justifiable?
 2. Purchase of Florida.
 - B. The Missouri compromise; the first "alarm bell" in slavery agitation.
 - C. The Monroe doctrine. What is it?
 1. Aimed particularly at the Holy Alliance, and at Russia, for different reasons. What? And what part applied to each?
 2. Present status.
 - D. Protective tariff of 1824; changing attitude of North and South as represented by Webster and Calhoun, with reasons.
16. John Quincy Adams elected by the house of representatives. Why?
 - A. The cry of "corrupt bargain." Why? Was it justifiable?
 - B. The American system, or the system of internal improvements at government expense.
 - C. The beginning of the National Republican-Whig party.
 - D. The first railroads.
 - E. "The Tariff of Abominations."
17. The reign of Andrew Jackson.
 - A. Jackson, the man; a new type in the presidency.
 - B. The "Kitchen Cabinet." What? Why so called?
 - C. The spoils system. (In this connection investigate the Crawford tenure-of-office act of 1820, and reason for it.)
 - D. Financial affairs:
 1. Veto of the United States bank bill.
 2. Removal of deposits, and Jackson's "pet" banks.
 3. Distribution of surplus.
 4. Speculation, especially in government lands.
 5. The "Specie Circular."
 - E. Constitutional questions.
 1. The Webster-Hayne debate.
 2. The tariff of 1832.
 3. Nullification. (Compare Jackson's attitude on this question with his position in regard to decision of the supreme court in favor of the Indians in Georgia, and adverse to that state. In which case was he right and in which wrong?) Results.
 4. Compromise tariff of 1833.
 - F. The *Liberator* established, 1831.
 - G. McCormick's reaper patented, 1834.
18. Van Buren becomes Jackson's political heir.
 - A. The panic of 1837 (for causes, see above).
 1. Events.
 - B. The subtreasury bill passed, 1840.

THE WHIGS TEMPORARILY SUCCESSFUL.

1. Election of Harrison and Tyler. (Tyler's previous political affiliation and the reason for his nomination by the Whigs, as well as the reason for his acceptance of the nomination, should be fully understood.)
 - A. Death of Harrison.
 - B. Tyler quarrels with Congress over bank bill.
 - C. Tariff of 1842 raises duties.
 - D. Webster-Ashburton treaty.
 - E. Dorr's rebellion.
 - F. Patroon war.
 - G. The magnetic telegraph.
 - H. The slavery question.
 1. The right of petition.
 2. Gag rule. What? Through whose efforts finally rescinded?
 3. Texas annexed. How? Why? What other territory has been annexed *by joint resolution*?

THE DEMOCRATIC PARTY RETURNS TO FULL POWER UNDER POLK.

1. Texas admitted as a state.
2. The Mexican war. (Investigate previous history of Mexico and Texas as to independence and status of slavery.)
 - A. Nominal causes. (Investigate basis and justice of cry "The re-annexation of Texas and re-occupation of Oregon"; also cause and outcome of cry of "Fifty-four Forty or Fight.")
 - B. Real cause.
 - C. Lincoln's "spot resolution"; its significance.
 - D. The Wilmot proviso.
 - E. Military events.
 1. Taylor's part in the war.
 2. Kearney's expedition.
 3. Fremont, Sloat and Stockton in California.
 4. Scott's campaign.
 - F. Treaty of Guadalupe-Hidalgo and results of the war.
3. Discovery of gold in California.
 - A. Results.
 1. On California.
 2. On rest of West.
 3. On slavery question.
4. Howe patents his sewing machine, 1846.

THE WHIGS WIN THEIR SECOND AND LAST VICTORY: TAYLOR AND FILLMORE.

1. The omnibus bill, or compromise of 1850.
 - A. Causes.
 - B. Provisions.
 - C. Results.
2. Clayton-Bulwer treaty. (Investigate relation to Hay-Pauncefote treaty and present Panama canal.)
 - A. Provisions.

THE DEMOCRATS AGAIN RETURN TO POWER, WITH PIERCE AS PRESIDENT.

1. Gadsden purchase.
2. Perry's expedition to Japan.
3. Ostend manifesto.
4. Kansas-Nebraska bill. (The intimate connection between the Mexican war, the discovery of gold in California, the compromise of 1850, and the Kansas-Nebraska act should be strongly emphasized, and the question as to whether the provision with reference to Arizona and New Mexico was put into the com-

4. Kansas-Nebraska bill—*continued*.

promise of 1850 as a "joker," to be used later in securing the repeal of the Missouri compromise, or whether it was simply used when the need arose, should be thoroughly investigated. See Burgess's *The Middle Period, in American History Series*.)

5. The struggle for Kansas.

[Supt. J. O. Hall has kindly given his permission to use that part of his "Outline of United States History" touching upon this phase of the subject.]

A. Preparations.

1. In the North: Emigrant aid companies.
2. In the South: Emigrants from Missouri and Southern states.
3. Leading men sent out.
4. Towns founded:
 - a. By free-state people: Topeka, Lawrence.
 - b. By pro-slavery people: Lecompton, Atchison, Leavenworth.

B. Beginning of the struggle.

1. A. H. Reeder appointed governor July 7, 1854.
2. Pro-slavery delegate elected to Congress November 29, 1854. Missourians voted at this election. Result: Increased bitterness and great accession to free-state forces.
3. Governor Reeder has census taken before calling election for members of legislature.
4. Pro-slavery territorial legislature elected March 30, 1855. Many Missourians voted at this election. Governor set aside election in eight districts, and called new election there. At new election pro-slavery people refused to vote, and free-state candidates were given certificates of election.
5. Legislature met at Pawnee at call of governor, July 2, 1855.
 - a. Its acts at Pawnee:
 1. Unseated all of free-state members elected at supplemental election called by governor, except one. Before legislature met one free-state member had refused to serve.
 2. Passed, over governor's veto, act to adjourn to Shawnee.
 - b. Its acts at Shawnee:
 1. Asked President to remove Governor Reeder.
 2. Passed Missouri slave code laws, and made it an offense to say or write anything against slavery.
 3. Located capital at Lecompton.
 4. Provided for a constitutional convention.
 5. Passed act entitled "An act to punish offenses against slave property."
6. Reeder forced to leave the territory.

C. Topeka constitution, anti-slavery, October, 1855.

1. Convention called by free-state people, September, 1855. This convention, which issued call for election, met in response to a call by an earlier political party convention at Big Springs. The general purpose of the free-state people was to avoid obeying acts of the Shawnee legislature, called "bogus legislature," and if possible secure admission as a free state.
2. Constitutional convention met at Topeka, October 23, 1855. Composed entirely of free-state members.
3. Free-state constitution formed, submitted to the people, and ratified by them December 15, 1855. Only free-state people voted.

5. The struggle for Kansas—*continued*.

C. Topeka constitution, anti-slavery, October, 1855.

4. State election held, Robinson elected governor, other state officers and state legislature chosen, January 15, 1856.
5. Officers did not attempt to assume charge of the government, except that legislature met, but simply held themselves in readiness to take charge when Kansas should be admitted as a state under the constitution.
6. Constitution sent to Congress and opposed by President Pierce. Approved by house, disapproved by senate.
7. Topeka legislature dispersed by U. S. troops, July 4, 1856.

D. Lecompton constitution, pro-slavery, 1857-'58.

1. Convention met September 11, 1857, in pursuance of call by pro-slavery legislature. Composed entirely of pro-slavery members.
2. As the convention saw that the people were likely to disapprove of the constitution they decided to submit to vote only the clause regarding slavery, and so people voting on it had to vote:
 - a. For the constitution with slavery, or
 - b. For the constitution without slavery; thus voting for slavery in either case, for the constitution provided that slave property in the territory should not be interfered with.
3. On the face of the returns the constitution was almost unanimously approved, as only pro-slavery people voted.
4. While the convention was in session the free-state people had elected a majority of new legislature at election at which occurred the Oxford, or Cincinnati Street Directory, frauds.
5. Free-state people urged governor to call special session of the legislature, which he did.
6. New legislature submitted constitution to the people so they could vote for or against it, and it was voted down almost unanimously, only free-state people voting.
7. Constitution sent to Congress and approved by senate, but disapproved by house. By the terms of the English bill, a compromise measure, the constitution was referred back to the people of Kansas for approval or rejection.
8. Constitution then rejected by more than 11,000 in total of 13,000 votes, August 2, 1858.

E. Leavenworth constitution, anti-slavery, 1858.

1. Convention met first at Minneola, March 23, in pursuance of an act declared to have been passed over the governor's veto, but which was not. The convention adjourned to Leavenworth.
2. General objects in view were:
 - a. Fight admission of Kansas under Lecompton constitution by showing Congress that people did not favor it.
 - b. Secure admission as a free state if possible.
3. Submitted to and approved by people, free-state people voting, May 18, 1858.
4. Sent to Congress but not approved by either house.
5. Convention composed entirely of free-state members.

5. The struggle for Kansas—*continued*.
 - F. Wyandotte constitution, anti-slavery, 1859-'61.
 1. Legislature submitted to people the question whether or not they wanted a constitutional convention, and the people said they did, March 28, 1859. Legislature soon called the convention.
 2. Convention met July 5, 1859. Members met as Republicans and Democrats, this being the first constitutional convention in Kansas in which more than one party was represented.
 3. Constitution ratified by the people, October 4, 1859.
 4. Robinson elected governor, and other state officers elected, December 6, 1859.
 5. Topeka made temporary seat of government.
 6. Constitution sent to Congress, but could not be approved in both houses till some of pro-slavery members withdrew on secession of Southern states.
 7. Congress approved the constitution, and the bill admitting Kansas as a state became a law January 29, 1861.
6. Buchanan's forecast of the Dred Scott decision.
7. The Dred Scott decision. (In connection with this and the preceding topic pupils should find Lincoln's story about "Franklin, Stephen, Roger and James," and explain its application. See Blaine's Twenty Years of Congress.)
 - A. History of the case.
 - B. Decision on case itself; decision on incidental points, or *obiter dicta*.
 - C. Results.
8. Panic of 1857.
9. The Lincoln-Douglas debates.
 - A. Why? Chief topic? What was Douglas's "Freeport doctrine"? What was its effect on him as a presidential possibility? Explain. (See Wilson's Division and Reunion, in Epochs of American History.)
 - B. Results as to Lincoln; explain.
10. John Brown; his raid, its purpose and result. (Especially, read Burgess's The Civil War and the Constitution, in American History Series.)
11. The presidential campaign of 1860.

TWENTY-FOUR YEARS OF REPUBLICAN RULE.

[Here the origin and composition of the Republican party should be carefully considered. All the direct causes of secession, from the introduction of slavery, in 1619, should also be reviewed.]

1. The secession of the Southern states. (It should be emphasized that this was due to the election of Lincoln on a platform opposing the extension of slavery, and not because either Lincoln or the Republican party was committed to the abolition of slavery.)
2. The formation of the Confederate government.
3. Buchanan's attitude, and his reason for it. Was it sound?
4. Efforts to compromise; proposals, and results.
5. Comparison of the sections.

6. The war.
 - A. Military operations. (These operations should be studied as being almost wholly offensive on the part of the North and defensive on the part of the South. And the war should be considered from the view of the two general purposes of the North—that is, to push the Confederate line of defense south and to blockade Southern ports. The three great efforts to accomplish the first of these results were to capture Richmond, to open the Mississippi, and to penetrate the heart of the Confederacy and capture Atlanta as the great central supply depot; and the success of these efforts, together with the establishment of an effective blockade, finally wore and starved the South out. Dodge's Bird's-eye View of the Civil War is the best single volume on the subject.)
 - B. Finances.
 - C. The border states.
 - D. The emancipation proclamation; three reasons for it. (See Wilson's Division and Reunion, in Epochs of American History.)
 - E. Results.
7. Lincoln's assassination and Johnson's succession.
8. Lincoln's reconstruction policy so far as developed.
9. Johnson's reconstruction policy; compare with Lincoln's as to liberality; cause of hostility of Congress.
10. Congressional reconstruction policy. Why did Congress have a constitutional advantage in the contest? What was the real status of the seceded states? Were they readmitted, or how did they get back into their former relationship?
11. Impeachment, trial and acquittal of Johnson.
12. The thirteenth amendment, 1865.
13. The Atlantic cable, 1866.
14. The purchase of Alaska, 1867.
15. Fourteenth amendment, 1868; compare with civil rights bill. Why was latter not considered sufficient?
16. Grant's elevation to the presidency.
17. The fifteenth amendment, 1870. What states had to ratify in order to resume former place in the Union?
18. Negro suffrage and "carpetbag government." (Should the negroes have been given the right of unrestricted suffrage?)
19. The Ku-Klux Klan.
20. The force bills, and use of the United States courts and United States army in the South.
21. Troubles with England, and their arbitration.
 - A. Alabama claims.
 - B. Fisheries question.
 - C. Northwestern boundary dispute.
22. Temporary civil service reform. (Why only temporary?)
23. The panic of 1873.
24. Demonetization of the silver dollar, 1873. Why? Why afterwards called the "Crime of '73"? Is silver dollar coined now? What is the present legal standard of value?

25. Resumption of "specie payment"; meaning; purpose; result. (In this connection the two contradictory decisions of the supreme court with reference to the legal-tender qualities of "greenbacks" should be investigated; the reason for the reversal of opinion, as well as the present status of the various kinds of paper money, should be understood.)
26. The "Credit Mobilier." (Show connection between this and the Liberal Republican movement.)
27. The "salary grab" act. (Compare its reception by the public with that of the recent increase in congressional salaries, and explain reasons for difference.)
28. The "whisky ring."
29. Indian troubles, and the killing of Generals Canby and Custer.
30. The only disputed presidential election in our history. (Pupils should see clearly and be able to explain just why the Hayes-Tilden contest did not go to the house of representatives for settlement.)
 - A. The cause of the dispute.
 - B. The Electoral Commission.
 1. How composed. (It should be clearly shown just how it came about that there were eight Republicans and seven Democrats.)
 2. Its duties.
 3. Its decision.
31. Withdrawal of Federal troops from the Southern states. (Was there an understanding between Hayes and the Democratic leaders that if allowed peaceably to take his seat he would withdraw the troops? As a matter of public policy was their withdrawal wise?)
32. The Bland-Allison act.
 - A. Reasons for.
 - B. Provisions.
 - C. Why vetoed by President. Was his action final?
33. Results of actual resumption of specie payment.
34. The election of Garfield and Arthur.
35. Strife within the party; stalwarts vs. half-breeds; Blaine vs. Conkling; resignation of Conkling and Platt, and result.
36. Assassination of Garfield.
37. The Pendleton civil-service-reform act. (Here the history of the "spoils system," and of attempts at civil service reform, should be reviewed, and pupils should note the connection between the spoils system and the assassination of Garfield, and between his death and the Pendleton act.)
38. The Chinese-exclusion act.
 - A. Reasons for.
 - B. Provisions.
 - C. Present status.
39. The Edmunds anti-polygamy act.
 - A. Purpose.
 - B. Later anti-polygamy legislation.
 - C. Present status of polygamy.

THE DEMOCRATS WIN THEIR FIRST PRESIDENTIAL ELECTION SINCE THE WAR.

1. Cleveland elected President; tariff the main issue, but personality of candidates an important factor in campaign.
2. The presidential-succession law.
 - A. Two reasons for.
 - B. Provisions.

3. Electoral-count act.
 - A. Reasons for.
 - B. Provisions.
4. Interstate-commerce act, 1887. (In this connection study should be made of "railroad rate" and "pure food" laws of the Roosevelt administration, and of the railroad bill of the Taft administration. From this point on Hall's Outlines and the annual volumes of the World Almanac, particularly the more recent ones, together with current-event magazines, will be found especially valuable.)
5. The Mills tariff bill.
 - A. Character.
 - B. Why it failed to become a law.
6. Cleveland's use of the veto power.
7. More anti-Chinese legislation.
8. The anarchists, and the Haymarket massacre.

THE REPUBLICANS ELECT HARRISON, BUT AS A MINORITY PRESIDENT.

[Pupils should be able to explain clearly how this is legally possible.]

1. The Reed rules in the house of representatives.
 - A. Reason for.
 - B. Provisions.
 - C. Compare with present rules. (Discuss recent changes.)
2. The McKinley bill, providing for the highest tariff in our history, free sugar, reciprocity.
3. The Sherman silver act, 1890.
 - A. Reason for.
 - B. Provisions.
4. Sherman antitrust act, 1890, its purpose and provisions.
5. Mafia troubles in New Orleans. (This should be compared with the Caroline affair in Tyler's administration and the Japanese school troubles in California in Roosevelt's administration. The serious and embarrassing position in which such difficulties place the national government and the reason therefor should be fully understood by the pupils. For discussion of this subject, see President Taft's first message to Congress.)
6. Growing use of the "Australian ballot," and advantages.
7. Original-package law.

CLEVELAND IS THE DEMOCRATIC PRESIDENTIAL CANDIDATE FOR THE THIRD TIME AND IS ELECTED.

1. Panic of 1893.
2. Repeal of purchasing clause of Sherman silver act.
3. Our relations with Hawaii.
 - A. Under Harrison's administration.
 - B. Under Cleveland's administration.
4. Trouble between Venezuela and Great Britain.
 - A. Cause.
 - B. The Monroe Doctrine and position of United States.
 1. Attitude of England.
 - C. Final arbitration.
5. The Pullman strike and resulting sympathetic strikes.
 - A. Events.
 - B. Attitude of President.
6. The Wilson tariff bill.
 - A. Material reduction of duties.
 - B. Income tax provision.
 1. Limit and levy.

6. The Wilson tariff bill—*continued*.
 - B. Income tax provision.
 2. What afterwards happened to it?
 3. What movement now on foot with reference to an income tax?
 - C. Enlarged free list.
 - D. Final action of President, and reason for it.
7. The campaign of 1896.
 - A. "The free coinage of silver at the ratio of 16 to 1" the "paramount" issue. (Pupils should understand clearly the meaning of this issue, and should in connection with it review previous silver legislation.)
 1. Arguments for.
 2. Arguments against.
 - B. Incidents.
 - C. The result.

REPUBLICANS IN COMPLETE CONTROL, WITH M'KINLEY AS PRESIDENT.

1. The Dingley tariff bill.
 - A. General provisions.
 - B. Reciprocity.
 1. Attitude of President.
 2. Attitude of senate.
2. Spanish-American war. (History of previous relations of Spain, Cuba and United States should be here reviewed—Ostend manifesto, Virginius affair, Ten Years' war, etc.)
 - A. Causes.
 - B. Events.
 - C. Results.
 - D. Government of our new possessions.
3. Annexation of Hawaii.
4. The gold-standard act, 1900.
 - A. The standard of value.
 - B. Changes in the national banking law.
5. Reëlection and assassination of McKinley.
6. Succession of Roosevelt.
7. Establishment of Department of Commerce and Labor.
8. Railroad-rate law.
9. Pure-food-and-drugs act.
10. Service-pension law.
11. Law limiting working hours of railroad employees.
12. The Panama canal. (Previous history of the project should be reviewed.)
 - A. The Clayton-Bulwer treaty.
 - B. The Hay-Pauncefote treaty.
 - C. The Hay-Herran treaty.
 - D. Independence of Panama and Hay-Varilla treaty.
 - E. Plans and progress of the work.
13. Temporary intervention in Cuba.
 - A. Cause.
 - B. Result.
14. Trust prosecutions.
15. Admission of Oklahoma.
16. The insurance and other "grafters."
17. Panic of 1907.
18. The Hague conference. (Movements toward international arbitration should be reviewed.)

19. Taft elected President.
20. The Aldrich-Payne tariff revision bill passed by special session of Congress.
 - A. Its provisions and their reception by the public.
21. The railway regulation act.
22. The postal savings bank law.
23. Bills for admission of Arizona and New Mexico.
24. The elections of 1910 and their general result.
25. Second regular session of sixty-first Congress.
 - A. The question of direct election of senators.
 - B. The Lorimer case.
 - C. Canadian reciprocity.
 - D. Other measures.
26. Special session of the sixty-second Congress.
 - A. Democrats control the house and elect Champ Clark speaker.
 - B. Senate so divided among Democrats, Regular Republicans, and Insurgent Republicans that there is no working party majority, though the Republicans nominally control.
 - C. The direct election of senators.
 - D. The Lorimer case reopened.
 - E. Canadian reciprocity.
 - F. The status of statehood for Arizona and New Mexico.
 - G. "The farmer's free list," and other tariff bills.
27. The conservation movement.
28. Decision of the supreme court in the Standard Oil and Tobacco Trust cases.
29. Status of international arbitration and the universal peace movement.
30. The revolution in Mexico.

After the work as here outlined has been covered the whole should be fixed, and a clearer idea of its unity be obtained, by a general review. And so far as possible this should be done by the topic method. As examples of subjects that may be thus treated the following may be mentioned:

- The evolution of the constitution.
- The origin and growth of political parties.
- Territorial expansion.
- Tariff legislation.
- The slavery question.
- Nullification and secession.
- Our financial system.

Each topic should be taken up from its first appearance in our history and traced to its end or to the present time, without the intervention of any except directly related subjects, and connections should be strongly emphasized.

As an illustration of how this may be done the following outline on the slavery question is given:

1. Slavery introduced, 1619.
2. Slavery in every colony, 1776.
3. First states to abolish slavery. What? Why?
4. Slavery in the constitution.
5. Invention of the cotton gin, 1793.
6. Legislation on slave trade, 1808, 1820.
7. Missouri compromise, 1820.
8. The *Liberator*, 1831.
9. Abolition societies.
10. Nat Turner's insurrection.
11. "Gag Rule."
12. The annexation of Texas.

13. The Mexican war.
14. The Wilmot proviso.
15. The "omnibus" bill or compromise of 1850.
16. The underground railroad.
17. The Kansas-Nebraska act.
18. Anti-slavery parties.
 - A. Abolition.
 - B. Liberty.
 - C. Free soil.
 - D. Republican.
19. "Uncle Tom's Cabin" and "The Impending Crisis."
20. The Dred Scott decision.
21. Lincoln-Douglas debates.
22. Lincoln elected President.
23. Secession of Southern states—war.
24. The emancipation proclamation.
25. Thirteenth, fourteenth, and fifteenth amendments.

CIVICS.

Interpretation comes through analysis, and to that end an outline is valuable. The study of civics should mean more than a knowledge of the separate parts of the constitution; it should include an appreciation of the structure and nature of the document from which are drawn the great principles of democracy, and a knowledge of its actual application in practice. Three main questions should be before the student and applied to each article, section and clause: First, What does it say? Second, What does it mean? Third, Explain its use, past and present.

Any text on civil government will be of some help. In addition to the adopted text, the outline is drawn from Ashley, "American Government," new and revised edition (The Macmillan Co., Chicago); Forman, "Advanced Civics," The Century Co., New York; Rush, "Constitution in Outline, with Questions and Answers," E. E. Rush, Kansas City, Mo.

SELF-GOVERNMENT.

"He that ruleth his spirit is better than he that taketh a city."—BIBLE.

- I. Self-control.
 1. The will directs action.
 2. A choice of right or wrong must be made.
- II. Self-control can be cultivated.
- III. The reward of doing right.
- IV. Self-government the foundation of all government.
- V. Name a fault opposed to each of the following virtues: Courage, industry, cheerfulness, liberality, tolerance.
- VI. Arrange the following in the order of their importance: Honesty, modesty, patience, reverence, truthfulness, liberality.
- VII. Arrange the following faults, placing first the one you dislike most: Stubbornness, cruelty, jealousy, anger, tardiness, hypocrisy.

FIRST DIVISION.—*History and Explanation.*

I. GOVERNMENT.

1. Basis.
 - a. Theoretical.
 - b. Actual.
2. Characteristic feature.
3. Definition.

4. Conclusion: Government can not be forced by theory; it is a growth of man's social nature, and we find it changing as his conditions change.

II. CIVIL GOVERNMENT.

1. Its origin.
 - a. In Northern Germany.
 - b. In England.
2. Its growth in America.
 - a. Transplanted from England.
 - b. In the colonies.
 - c. In the States.
 - d. In the Nation.
 - e. The purpose.
 - f. Definition.
3. Conclusion: When civil government is properly organized and administered it produces wholesome laws and mutual advantages for those who come under its rule.

III. FORMS OF CIVIL GOVERNMENT.

A.—As to time:

1. Ancient.
 - a. Monarchy (the rule of one).
 - b. Aristocracy (the rule of a few).
 - c. Democracy (the rule of many).
2. Modern.
 - a. As to power.
 1. Federated.
 - a. States banded for mutual protection, each state retaining its original power.
 - b. Banded states—states united to form a stronger government, each state yielding a portion of its original power to the general government.
 2. Centralized: each state yielding all authority to the central government.
 - b. As to operation.
 1. Pure democracy (local).
 2. Representative democracy (local and national).

B.—As to expression:

1. Unwritten.
 - a. Disadvantages.
 - b. Advantages.
2. Written.
 - a. Disadvantages.
 - b. Advantages.

C.—Conclusion:

That form of government is the best under which a people attain the highest happiness and usefulness in the arts of a Christian civilization.

IV. THE GROWTH OF GOVERNMENT FROM THE EARLY COLONIAL TIMES TO 1789.

1. Claims of European nations in America.
 - a. Spain.
 - b. France.
 - c. England.
2. Supremacy of England in 1763.
 - a. Determined the dominant race for America.
 - b. Determined the dominant religion for America.
 - c. Determined the dominant government for America.

3. England established government in America.
 - a. Chartered government.
 1. Its origin.
 2. Its nature.
 - b. Proprietary government.
 1. Its origin.
 2. Its nature.
 - c. Royal province government.
 1. Its origin.
 2. Its nature.
4. Revolutionary states organized government.
 - a. The state constitution.
 1. A written document.
 2. Defines the limits of authority.
 3. Distributes the authority.
 - a. To the legislative.
 - b. To the executive.
 - c. To the judicial.
 - b. The local units.
 1. The county.
 2. The township.
 3. The school district.
 - c. The articles of confederation.

These articles were not suitable for a strong government.

 1. Defective in organization.
 - a. Legislative.
 1. Term too short.
 2. Service limited.
 3. State could recall.
 4. Salary paid by the state.
 5. Had no authority over commerce.
 2. Defective in operation because no power to punish individuals.
 - a. Taxation—no power to collect.
 - b. Armies and navies—no direct powers.
 - c. Could not enforce—simply advise.
 3. *Conclusion*: The articles of confederation was a form of law which the states were supposed to respect and obey.
5. The United States of America established the present constitution in 1789.

This constitution is suitable for a strong government.

 - a. Power in organization.
 1. Legislative.
 - a. Length of term reasonable.
 - b. Service unlimited.
 - c. Membership beyond recall.
 - d. Salary paid from United States treasury.
 2. Executive—with constitutional powers.
 - a. Civil.
 - b. Military.
 3. Judicial—with highest legal powers.
 - b. Power in the operation of government.
 1. Taxation—can collect.
 2. Army and navy—can create.
 3. Execute the laws.
 - c. *Conclusion*: The constitution of the United States is an instrument of law, operative upon the several states and the people within the states collectively and individually.

V. DEFINITIONS AND GENERAL PRINCIPLES.

1. Define state; sovereign state; dependent state.
2. Define United States constitution; state constitution.
3. Elements of weakness.
 - a. In a written constitution.
 - b. In an unwritten constitution.
4. When does the right of revolution exist?
5. The constitution: How framed? How ratified?
6. Compare the articles of confederation and the present constitution.
 - a. In organization.
 - b. In operative powers.
7. What is the supreme law? (Art. VI: 2.)
8. Twelve important events in the growth of American government from 1763 to 1789.
 - a. The treaty of Paris, 1763.
 - b. The stamp-act congress, 1765.
 - c. The first continental congress, 1774.
 - d. The second continental congress, 1775.
 - e. The declaration of independence, 1776.
 - f. The battle of Saratoga, 1777.
 - g. The articles of confederation, 1781.
 - h. The peace of Paris, 1783.
 - i. The Alexandria convention, 1785.
 - j. The Annapolis convention, 1786.
 - k. The Philadelphia convention, 1787.
 - l. The present constitution, 1789.

SECOND DIVISION.—*The Constitution in Outline.*

PREAMBLE.—Memorize.

I. ARTICLE I.—LEGISLATIVE POWER.

A.—Organization of Congress.

(When possible, all answers should be verified by article, section and clause of the constitution.)

1. House of representatives.
 - a. Composed of.
 - b. Elected by.
 - c. Qualifications.
 1. Age.
 2. Citizenship.
 3. Inhabitaney.
 - d. Fixing the ratio.
 - e. Representative at large.
 - f. Number.
 1. The maximum allowed.
 2. The minimum required.
 3. The actual number.
 - g. The salary and perquisites.
 - h. The term.
 - i. Vacancy.
 1. How created.
 2. How filled.
 - j. Officers.
 - k. Sole power.
 - l. The duty of a representative.
2. The senate.
 - a. Composed of.
 - b. Elected by.

2. The senate—*continued*.
 - c. Qualifications.
 1. Age.
 2. Citizenship.
 3. Inhabitaney.
 - d. The number.
 - e. Salary and perquisites.
 - f. The term.
 - g. Vacancy.
 1. How created.
 2. How filled.
 - h. The officers.
 - i. Sole power.
 - j. The duty of a senator.
3. Essential for self-preservation.

Each house decides—

 - a. Who are elected to membership.
 - b. The rules for its proceedings.
 - c. Punishment for disorder.
 - d. When to expel a member.
 - e. Who may be its officers, except as to the president of the senate.

B.—Congress: Its Powers, Prohibitions and Operation.

A. POWERS.

1. *To raise revenue.* (I:8:1.)
 - a. By taxation.
 1. Direct.
 - a. Capitation.
 - b. Land.
 - c. Personal property.
 2. Indirect.
 - a. Duties—specific, advalorem.
 - b. Excises—specific, advalorem.
 - b. By borrowing money. (I:8:2.)
 - c. Give a historical account of the following:
 1. First revenue bill, 1789.
 2. Protective tariff, 1816.
 3. Canadian reciprocity, 1911.
 4. In what way are these measures related to I:8:1?
2. *To regulate commerce.* (I:8:3.)
 - a. Interstate Commerce Commission.
 1. Its organization.
 2. Its powers.
 3. Its service.
 - b. Give historical account of the following:
 1. The embargo act, 1807.
 2. The nonintercourse act, 1809.
 3. Antitrust laws, 1890, and recent supreme court decisions thereon.
3. *To regulate naturalization.* (I:8:4.)
 - a. Citizenship.
 1. Constitutional definition. (Am. XIV:1.)
 2. The international rule.
 3. Classes.
 - a. Natural born.
 - b. Naturalized.
 - b. Plan to determine citizenship.

Persons answering "Yes" to any one of the following questions are citizens of the United States:

 1. Were you born in the United States?
 2. Have you taken out naturalization papers?

A. POWERS—*continued.*

3. *To regulate naturalization.* (I:8:4.)
 - b. Plan to determine citizenship.
 3. Was your father an American citizen before you became of age?
 4. Were you a citizen of any territory annexed to the United States having a treaty clause providing for citizenship?
 5. Is your husband a citizen of the United States?
 6. Have you served one year in the regular army or navy and received an honorable discharge therefrom?
 - c. Methods of naturalization.
 1. The five-year process.
 - a. The times required.
 - c. Who issues the papers.
 2. The marriage process.
 3. By the annexing of territory.
 - a. When terms are stated.
 - b. When no mention is made concerning citizenship.
 4. The military process.
 5. The "renewal of domicile" process.
 - d. Important naturalization acts.
 1. The continental congress, 1776.
 2. Congress in 1790.
 3. Congress in 1795.
 4. Congress in 1798.
 5. Congress in 1802.
 6. Congress in 1882.
 - e. Why should an alien desire to become a citizen of the United States?
4. *Bankruptcy.* (I:8:4.)
 - a. A bankrupt is one who has been declared by a court to be owing more than he can pay.
 - b. Purposes.
 1. Distribution of property.
 2. Discharge from present debts.
 - c. Kinds.
 1. Voluntary.
 2. Involuntary.
5. *Money and coinage.* (I:8:5.)
 - a. United States money is a measure of value expressed in coin.
 - b. Money.
 1. Metal.
 - a. Gold—various denominations.
 - b. Silver—various denominations.
 - c. Nickel.
 - d. Copper.
 - e. Locate the mints.
 2. Paper.
 - a. Gold certificate.
 - b. Silver certificate.
 - c. United States notes.
 - d. Treasury notes.
 - e. National bank notes.
 - f. What gives value to each of these several issues?
6. *Counterfeiting.* (I:8:6.)
 - a. Consists in—
 1. Manufacture.
 2. Circulation; or having in possession, with intent to circulate, spurious coins or securities.

A. POWERS—*continued*.6. *Counterfeiting*. (I:8:6.)

- b. Penalties.
 - 1. Fine.
 - 2. Imprisonment.
- c. What are securities?
- d. What are current coins?
- e. Will you include stamps and money orders in your definition?

7. *Post offices*. (I:8:7.)*

- a. Foreign mails.
 - 1. Carriage.
 - 2. Postage.
- b. Domestic service.
 - 1. Presidential offices—those paying \$1000 or more.
 - 2. Minor offices—paying less than \$1000.
 - 3. Post roads—designated by Congress.
 - a. Wagon roads.
 - b. Waterways.
 - c. Railroads.
- c. Postage.
 - 1. Principles.
 - a. Equal rights of all to use the mail service.
 - b. Secrecy of the mails.
 - c. Low postage.
- d. Classes of mail.
 - First class: letters, postals and all matter sealed against inspection.
 - Second class: newspapers and publications issued as often as four times a year.
 - Third class: books, manuscripts and seeds.
 - Fourth class: merchandise not included in the other lists and limited to four-pound packages.
- e. Free delivery.
 - 1. In cities of 10,000 population, or over.
 - 2. Where receipts are \$10,000 or over.
 - 3. In country communities where routes have been established.
- f. Development in the service. Give historical sketch from 1782 to the present.
- g. In what way are the following topics related to the post-office clause?
 - 1. The Cumberland road of 1807.
 - 2. International Postal Union of 1891.
 - 3. Ownership of telegraph lines in 1866.

8. *Patents and copyrights*. (I:8:8.)

- a. Purpose of the clause.
- b. How is the purpose promoted?
- c. Patent.
 - 1. How obtained.
 - a. Make oath that he is the inventor.
 - b. Submit descriptions and drawings.
 - c. The article must be new, unused and useful.
 - 2. Expense.
 - a. A fee of \$15 must be sent with the application.
 - b. An additional fee of \$20 must be paid when patent is granted.
 - 3. Results.
 - a. Sole right to make and sell.
 - b. Good for how long?

A. POWERS—*continued.*8. *Patents and copyrights.* (I:8:8.)

4. Principles.

- a. Fee is small.
- b. Patents recorded for comparison.
- c. Patents are for a brief term.
- d. Exclusive right to use and sell.

d. Copyright.

1. How obtained.

- a. Give name of author.
- b. Copy sent to librarian of Congress.
- c. Publication must bear the date of the copyright issued.

2. Benefits secured.

- a. Exclusive rights to publish—for how long?
- b. At home and in some foreign countries.

9. *The war powers.* (I:8:10-16.)

- a. Suppress piracy.
- b. Declare war.
- c. To raise and support armies.
- d. To provide and maintain a navy.
- e. Regulation of the army and navy.
- f. Calling forth the militia.
- g. Organizing and disciplining.

10. *The property clause.* (I:8:17.)

- a. Where have our national congresses held sessions—temporary and permanent capitals.
- b. Exclusive legislation over what?

11. *The elastic clause.* (I:8:18.)

- a. This clause gives rise to what two constitutional constructions?
- b. Apply the meaning of this clause to the following:
 - 1. The first United States bank, 1791.
 - 2. The embargo act, 1807.
 - 3. Purchase of Louisiana, 1803.
 - 4. Protective tariff of 1816.
 - 5. The Philippines acquired, 1898.

B. Prohibitions.

In an effort to protect the rights and liberties of the people, the constitution prescribes some prohibitions—

1. *On Congress.* (I:9.)

a. Absolute.

- 1. No bill of attainder shall be passed.
- 2. No *ex post facto* law shall be passed.
- 3. No tax shall be laid on exports from any state.
- 4. No preference to certain ports.
- 5. Vessels from state to state shall not be taxed.
- 6. No title of nobility shall be granted by the United States.

b. Conditional.

- 1. Clause of article I, section 9, limited in time and taxation, but is now obsolete.
- 2. Writ of habeas corpus conditioned on public safety.
- 3. Capitation or other direct tax conditioned on I:2:3.
- 4. Withdrawal of money—by appropriation bills.
- 5. Titles of nobility—conditioned.
 - a. Nonofficeholders.
 - b. Officeholders, by permission of Congress.

B. Prohibitions—*continued*.2. *On states.* (I:10.)

a. Absolute: A state is forbidden—

1. To make a treaty.
2. To make an alliance.
3. To form a confederation.
4. To grant letters of marque.
5. To coin money.
6. To emit bills of credit.
7. To make anything but gold and silver legal tender in payment of debts.
8. To pass any bill of attainder.
9. To pass an *ex post facto* law.
10. To pass a law impairing the obligation of a contract.
11. To grant titles of nobility.

b. Conditional.

1. Import duties.
 2. Export duties—both conditioned on necessity and subject to revision by Congress.
 3. To keep troops.
 4. War supplies.
 5. To make agreements with other states.
 6. To engage in war.
 7. To make agreements with foreign nations.
- All conditioned on emergency and consent of Congress.

C. Operation.

1. *Plan for law-making.* (I:7.)

- a. A bill is a proposed law.
- b. All bills for raising revenue shall originate in the house of representatives.
- c. Before any bill becomes a law it shall be approved by any one of the following methods:
 1. a. Passed by majority in each house.
 - b. Signed by the President.
 2. a. Passed by majority in each house.
 - b. Vetoed by the President.
 - c. Repassed by two-thirds majority in each house.
 3. a. Passed by majority in each house.
 - b. Not signed or returned in ten days, Sundays excepted, unless Congress adjourns before the ten days expire.

2. *The committee system.*

- a. Appointments.
- b. Methods.
 1. Logrolling.
 2. Filibustering.
 3. Pairing.
- c. Advantages.
- d. Disadvantages.
- e. Discuss the possibility of maintaining our present form of government without the committee system.

II. ARTICLE II.—EXECUTIVE DEPARTMENT.

Vested Power. (II:1:1.)

THE EXECUTIVE POWER SHALL BE VESTED—

A. In a President of the United States.

1. For a term of four years.

- B. And with the Vice President, shall be elected as follows:
1. The college method. (II:1:2.)
 - a. Election of electors: how? when?
 - b. Number of electors.
 - c. Who may not be an elector.
 - d. Duty of electors. (Am. XII.)
 1. Meet: where? when?
 2. Vote: how? for whom?
 3. Lists: how made? how disposed of?
 - e. President of the Senate.
 1. The opening of the lists.
 2. The counting.
 3. The result.
 2. The house-and-senate method. (Am. XII.)
 - a. President.
 1. Chosen by.
 2. Candidates: how many?
 3. Voting.
 4. State power.
 5. Quorum.
 6. Necessary to a choice.
 - b. Vice President.
 1. Chosen by.
 2. Candidates: how many?
 3. Voting.
 4. State power.
 5. Quorum.
 6. Necessary to a choice.
- C. Qualifications for the President. (II:1:4.)
1. Age.
 2. Citizenship.
 3. Inhabitation.
 4. Am. XIV.
 - a. Not holding any other office.
 - b. Not guilty of disloyalty.
- D. Vacancy: created by—
1. Expiration of term.
 2. Death.
 3. Temporary inability.
 4. Impeachment and conviction of—
 - a. Bribery, treason, misdemeanors.
- E. Vacancy filled by—
1. Election.
 2. Vice President.
 3. Cabinet. (See succession law.)
- F. Salary.
1. Constitutional provision.
 2. The law.
- G. Oath of office. (II:1:7.)
- H. Powers.
1. Military. (II:2:1.)
 2. Civil. (II:2 and 3.)
 - a. Legislative.
 1. Send messages to Congress.
 2. Sign or veto bills.
 3. Call extra session of Congress.
 4. Adjourn Congress when the Houses fail to agree to adjourn.

H. POWERS—*continued*.

2. Civil. (II:2 and 3.)

b. Executive.

1. Sole powers.

a. Commander-in-chief of army and navy.

b. Demand reports.

c. Appointment to some inferior offices.

2. Shared powers.

a. To make treaties.

b. To appoint—

1. Diplomats.

2. Judges.

3. Some civil service.

c. Judicial power.

1. Pardon.

2. Amnesty.

3. Reprieve.

4. Commutation.

5. Parole.

I. Duties.

1. The President at all times must himself be governed by law.

2. He must execute the laws.

What two means to that end has he at his command?

3. Recommend measures to Congress.

4. Receive foreign representatives.

The cabinet is a strong arm of the executive, yet it rests upon narrow constitutional grounds. (II:2.) The work of the cabinet is sufficiently set forth in Boynton, ch. XII.

III. ARTICLE III.—THE JUDICIAL DEPARTMENT.

A. *Organization*. (III:1:1.)

1. One supreme court.

2. Inferior courts.

B. *Appointment of judges*.

1. By President with consent of Senate.

2. During good behavior.

C. *Salary*.

1. Constitutional statement.

2. Present amount.

D. *The courts*.

a. Regular.

1. Supreme.

a. Time of meeting.

b. Number of judges.

c. Original jurisdiction.

d. Appellate jurisdiction.

2. Appellate courts.

a. The number of courts.

b. Held by what judges.

c. Purpose of the court.

d. Its jurisdiction.

3. District courts.

a. The present number.

b. A district is either a state or a part of a state.

c. Its jurisdiction.

d. Cases, where brought.

4. The commerce court.

a. Appointment of judges.

b. Jurisdiction of the court.

D. *The courts—continued.*

b. Irregular.

1. Court of claims.
 - a. Where held.
 - b. Judges.
 - c. Purpose of the court.
2. District of Columbia court.
 - a. Judges.
 - b. Jurisdiction of the court.
3. Territorial courts.
 - a. Where established.
 - b. Judges—tenure of office.
 - c. Jurisdiction of the court.
4. Consular courts.

The judicial duty of a consul may be to hold court for any one of the following reasons:

- a. To examine for crime committed on the high seas.
- b. To hear complaints of seamen.
- c. To reclaim deserters.
- d. To extend relief to destitute seamen.
- e. To probate wills.
- f. To conduct a trial in half-civilized countries when an American citizen is party to the suit.

IV. ARTICLE IV.—THE RELATION OF STATES.

- A. To each other.
 - a. Analyze the "full faith and credit" clause.
- B. To the citizens.
 - a. Privileges.
 - b. Immunities.
- C. To territory.
 - a. Control.
 - b. Admit to statehood.
 1. Methods.
 - a. Discover three processes.
 2. What states have been admitted?
- D. Historical topics.

In what way are the following related to the general subject?

 - a. The Missouri compromise, 1820.
 - b. The compromise of 1850.
 - c. The Kansas-Nebraska act, 1854.
 - d. The Dred Scott case, 1857.
- E. The preamble sets forth the purposes of the constitution; why was article IV written?

V. ARTICLE V.—AMENDMENTS.

A. How secured.

First method:

1. Proposed by two-thirds vote of each house of Congress.
2. Ratified by legislatures of three-fourths of the several states.

Second method:

1. Proposed by two-thirds vote of each house of Congress.
2. Ratified by conventions in three-fourths of the several states.

Third method:

1. Proposed by a convention called by Congress.
2. Ratified by the legislatures of three-fourths of the several states.

All amendments so far have been secured by the first method.

B. Amendments adopted.

The first ten, 1791: Personal rights.

The eleventh, 1798: Citizens can not sue a state.

The twelfth, 1804: Changed method of electing president.

The thirteenth, 1865: Freed the slaves.

The fourteenth, 1868: Defines citizenship.

The fifteenth, 1870: Protects the right to vote.

What may be our sixteenth and seventeenth amendments?

C. Amendments prohibited.

1. Absolute.

a. Before 1808. (I:9:1.)

b. Method of direct tax. (I:9:1 and 4.)

2. Conditional.

a. Affecting the equal right of a state. (I:3:1.)

VI. ARTICLE VI.—NATIONAL INTEGRITY AND LAW.

A. National debts.

All debts contracted and engagements entered into before the adoption of this constitution shall be as valid against the United States under this constitution as under the confederation.

B. Supreme law.

a. This constitution.

b. The laws of the United States.

c. Treaties made from 1789 to the present.

C. Persons under oath to support the constitution.

a. Those who make the law.

b. Those who enforce the law.

c. Those who interpret and apply the law.

VII. ARTICLE VII.—RATIFICATION.

A. Conditions:

The ratification of the conventions of nine states shall be sufficient for the establishment of this constitution between the states so ratifying.

B. Questions.

a. Over how many states was the constitution to be binding?

b. What original state did not help write the constitution?

c. When did this constitution go into full operation?

THE STATE CONSTITUTION.

1. Definition:

The state constitution is a written instrument defining the powers of the state and distributing those powers to the various branches and departments thereof.

2. Branches.

A. *Legislative.*

a. House of representatives.

1. Apportionment: how obtained?

2. Members: number, term, chosen, qualifications.

3. Districts.

4. Officers of the house.

b. Senate.

1. Apportionment: how obtained?

2. Members: number, term, chosen, qualifications.

3. Districts.

4. Officers of the senate.

c. Sessions: time, number, quorum, adjournment.

2. Branches—*continued*.

- d. Duties and powers: journal, voting, salary.
- e. Law-making: Define a bill, a law; give the form of the enacting clause; readings, veto, publication.
- f. Locate on a map your congressional district; your state representative district; your state senatorial district.

B. *Executive*.

- 1. Make a list of seven executive officers.
- 2. Qualifications required.
- 3. Administrative officers and boards: their duties.
 - a. Railroad Commissioners.
 - b. State Board of Education.
 - c. Board of Agriculture.
 - d. Board of Equalization.
 - e. Regents of state institutions.
 - f. Board of Control.
- 4. The election, term and duties of officers in the following:
 - a. The county.
 - b. The township.
 - c. The city.
 - d. The school district.

C. *Judicial*.

- 1. Supreme court.
 - a. Judges: election, tenure, qualification, salary.
 - b. Jurisdiction, terms of court.
- 2. District courts: how organized, number, election of judges, salary, term.
- 3. Probate courts: number, election of judges, qualification, salary, term, jurisdiction.
- 4. Justice of the peace courts: number, election, term, salary, jurisdiction.
- 5. City courts: created by what authority? number, term, election, salary, jurisdiction.
- 6. Explain—
 - a. Difference between civil and criminal case.
 - b. Between damage case and an injunction case.
 - c. Between grand jury and petit jury.

ECONOMICS.

INTRODUCTION.

There are many good introductory texts in economics, but an excellent one for use in the high schools of this state is Bullock's Introduction to Economics, upon which this course is based.

This text is taken as a guide and should be studied intensively, yet it is recommended that from thirty to fifty pages in one of the following books be read and outlined each week: Seager's Introduction to Economics; Seligman's Principles of Economics; Ely's Outlines of Economics; Fetter's Principles of Economics; Blackmar's Economics; Hadley's Economics; Bullock's Selected Readings.

The average class will be unable to complete this amount of work in a half-year; hence chapters 14 and 15 in the text may be omitted without serious loss.

There is scarcely a lesson after chapter 3 in which economic principles can not be applied to practical life about us. In this way a great deal of so-called laboratory work can be done, which will not only make the subject more interesting but aid the pupil to incorporate economical living in his own daily life. It will assist him more easily to understand much of the complex business of to-day.

ECONOMIC HISTORY OF THE UNITED STATES.

- I. Westward expansion.
 - a. Six stages of expansion.
 - b. Meaning of "American frontier."
- II. Land tenures.
 - a. Condition in Europe.
 - b. In the United States.
 1. Economic explanation of difference between the North and the South.
 - c. Meaning of "public domain."
 1. What territory has never been a part of this?
 2. Manner of disposal.
 3. Result of past system of disposal.
- III. Growth of population.
 - a. Number and distribution at close of intercolonial wars. Beginning of Revolution.
 - b. Increase.
 1. Naturally.
 2. By immigration.
 3. Causes of each.
 - c. Causes of mobility of population.
 - d. Causes of growth of cities.
- IV. Systems of labor.
 - a. Need of laborers.
 - b. Kinds.
 1. Free persons, unable to pay transportation.
 2. Political or criminal offenders.
 3. Debtors or those sold for criminal offenses.
 - c. Contrast colonial system with slavery.
 - d. Causes of decline and end of system.
 - e. Slavery.
 1. Early history.
 2. Growth in United States.
 3. Economic reasons for slavery.
 4. Disposition of Southern leaders; Northern leaders.
 5. The question of abolition.
 6. An economic impedient of the South.
 7. Abolition, a removal of a barrier.
 - f. Free laborers:
 1. How recruited.
 2. Scarcity caused by free land.
 - g. Class of laborers in the colonies.
 1. Agriculturists and domestics.
 2. Skilled.
 3. Unskilled.
 - h. Status of labor at present.

THE GROWTH OF FOUNDATIONAL INDUSTRIES.

- I. General view of all industries.
- II. Fur trade and cattle raising.
 - a. Distribution of each industry.
 - b. Economic significance of fur trading.
 - c. Reasons for English colonization in America, rather than French or Spanish.
- III. Agriculture.
 - a. Early colonial history; later history of cereals.
 - b. History of grasses, vegetable products, etc.
 - c. Difference between extensive and intensive farming.
 - d. Present problem of conservation of soils in America.
- IV. Fisheries and mining.
 - a. History and development of each.

MANUFACTURES AND TRANSPORTATION.

- I. Colonial manufactures.
 - a. During the eighteenth century, in the home and on the farm as an economic unit.
 - b. Production for markets.
 - c. Early manufactures.
 - d. Hindrances to colonial manufactures.
 - 1. Limitations and prohibitions of England.
 - 2. Sectionalism.
 - 3. Scarcity of labor and high wages.
 - e. Hamilton's report in 1791.
- II. Industrial revolution.
 - a. Time.
 - b. Economic condition in England.
 - 1. Along the line of manufacturing.
 - 2. Commerce and transportation.
 - 3. Status of labor and capital.
 - 4. Experience of Adam Smith. Who was he?
 - 5. Names of inventors and inventions. Effect of each invention.
 - c. Results of revolution in England.
 - 1. Concentration of capital in factories.
 - 2. Concentration of machinery.
 - 3. Division of labor and better organization.
 - 4. Laws and customs become obsolete.
 - 5. Appearance of competition.
 - 6. Destruction of medieval restrictions.
 - d. Conditions in the United States.
 - 1. In manufacturing.
 - 2. Prohibitions and inventions.
 - 3. Results of embargo acts.
- III. Transportation.
 - a. Early history.
 - b. Internal improvement during "Era of Good Feeling."
 - 1. Cumberland road.
 - 2. Period of canal building.
 - 3. Beginning of railroad building.
 - 4. Five stages in railroad building.
 - 5. Present tendency.
- IV. Ship building.
 - a. Colonial period.
 - b. National period. Hindrances to American shipping.
 - c. First period of steamships.
 - d. Causes for decline of our merchant marine.
 - 1. Effect of privateers during Civil War.
 - 2. Construction of iron vessels in England more cheaply than in America.
 - 3. American vessels built of wood.
 - 4. Slowness of Americans to turn to steamships.
 - 5. Cost of American labor.
- V. Textile industries.
 - a. Effect of embargo acts and power loom.
 - b. Distribution of cotton industry.
 - c. Causes for slow growth of woolen industry.
- VI. Iron and steel industries.
 - a. Result of industrial revolution.
 - b. Effect of improved methods.

CONSUMPTION OF WEALTH.

- I. Definition of "economics." (Consult other texts for at least ten definitions.)
 - II. Origin of human wants.
 - a. Difference between wants of man and lower animals.
 - b. Between savagery and civilization.
 - III. Development of human wants.
 - a. Mark of progress of human race.
 - IV. Classification of wants.
 - a. Wants for material things.
 - b. Personal services.
 - c. Existence.
 - d. Culture.
 - V. Economic goods.
 - a. Definition of utility, wealth. Illustrate each from daily observation.
 - b. Difference between economic and free goods. Illustrations.
 - c. Kinds of utilities with illustrations of each.
 1. Elementary.
 2. Form.
 3. Place.
 4. Time.
 - VI. Consumption of wealth.
 - a. Consumption is the destruction of utilities.
 1. Difference between durable and perishable wealth.
 2. Sacrifice necessary in consumption and production.
 - VII. Law of diminishing utility.
 - a. Illustrate the law, as well as show total and marginal utility.
 - b. Illustrate the economic order of consumption, graphically.
 - VIII. Distinguish between present and future goods, productive and final consumption.
 - a. Use illustrations from daily experiences.
 - IX. State principles of Engel's law.
 - a. Apply same from individual experiences.
 - X. Economy in consumption.
 - a. Meaning of "standard of living."
 - b. Difference between a luxury and a necessity.
 - XI. Household economy.
 - a. Five means of waste in consumption of food.
 - XII. Saving.
 - a. Two forms.
 - b. Great importance of saving.
 - c. Desirability of saving.
 - XIII. Demand.
 - a. Definition.
 - b. How are sacrifices measured? Illustrate.
 - c. How does it vary? Illustrate fully.
- Daily problems:*
1. Is an automobile a culture or existence want? Your reasons.
 2. Is an old spinning wheel wealth? Your reasons.
 3. Mr. A. is a lawyer. Are his personal services economic goods? Why?

PRODUCTION OF WEALTH.

- I. Production in general.
 - a. Production is the creation of utilities.
 1. Compare with consumption.
 2. Natural and accidental wealth creation.
 3. Various forms of productive industry.
 4. Incentive to labor.
 5. Personal services as instruments of production.
- II. Factors of production.
 - a. Nature.
 - b. Man or labor.
 1. Classification.
 2. Standard of living.
 - c. Capital.
 1. Wealth used in further production of wealth.
 2. Concrete forms.
 3. Other classifications.
 4. Process of formation.
 5. Influence to saving.
- III. Localization of an industry.
 - a. Proximity to a market.
 - b. Conditions of climate and soil.
 - c. Mineral resources.
 - d. Water ways and water power.
 - e. Proximity to labor supply.
 - f. Special influences.
 - g. Advantages of an established center.

THE PRODUCING OF WEALTH.

- I. Organization of the factor of production.
 - a. Simple associated effort.
 - b. Division of occupation.
 - c. Division of labor.
 1. Four advantages.
 2. Four disadvantages.
 3. Two ways in which disadvantages may be overcome.
 - d. Exchange of products.
 - e. Coöperation of productive factors.
 1. Entrepreneur system.
 2. Business partnership.
 3. Corporation.
 4. Coöperative production (students' clubs).
 5. Management by state.
 - f. Participation in production by the state. Five ways.

The preceding classification can and should be accompanied by illustration from daily experiences.

- II. Stages in the development of production.
 - a. Hunting and fishing. Four conditions.
 - b. Pastoral stage. Three conditions.
 - c. Agricultural. Five conditions.
 - d. Manufacturing. Five conditions.
 - e. Industrial. Five conditions.
- III. Freedom of investment of capital and labor.
 - a. Inducement.
 - b. Condition in France, England.
 - c. Issuance of charters.
- IV. Analysis of cost of production.
 - a. Elements of sacrifice.

- V. Investment of labor and capital.
 - a. Law of diminishing returns.
 - 1. Applied to agriculture, manufacturing, mining.
 - 2. Make practical application from local industries.
- VI. Large-scale production.
 - a. Advantages.
 - b. Counteracting forces.

THE THEORY OF EXCHANGE.

- I. Exchange in general.
 - a. Development of exchange.
 - 1. Among civilized peoples.
 - 2. Various stages.
 - b. Advantages.
 - 1. An old view.
 - 2. Other present-day advantages.
 - c. Mechanism.
- II. Value.
 - a. Meaning of value, price, market, and competition.
- III. Market value.
 - a. Definition.
 - b. Meaning of demand and supply.
 - c. Illustration of law of demand and supply.
 - d. Forced sales.
- IV. Normal value.
 - a. Difference between normal and average price.
 - b. Illustration of force governing normal value.
 - c. Industrial versus commercial competition.
 - d. Elements in cost of production.
 - 1. Labor.
 - 2. Abstinence.
 - 3. Differences in cost of production.
 - 4. Competition breaks down.
- V. Exceptions to theory of normal value.
 - a. Custom and value.
 - b. Failures of competition.
 - c. Taxes.
 - d. Mistakes in production.
 - e. Large fixed capitals.
 - f. Products and by-products.
 - g. Expenses.
 - h. Monopolies.

MONEY.

- I. Development of metallic money.
 - a. Origin of money.
 - b. Reasons for precious metals used as money.
 - c. History of coinage.
 - d. Characterize the following terms: free and gratuitous coinage, brassage, seigniorage.
 - e. Origin of coinage systems.
 - 1. Work of various governments.
 - 2. Meaning of legal tender.
 - 3. Different forms.
- II. The value of metallic money.
 - a. Marginal utility.
 - b. Explain changes in general price.
 - c. Effect of demand and supply of money on general price.
 - d. Effect of cost of production of precious metals.
 - e. History of the production of gold and silver.
 - f. Name and illustrate the four functions of money.

- III. Debased money.
 - a. Define accurately.
 - b. State Gresham's law and give its limitations. Who is Gresham?
 - c. Causes leading to increase in silver coinage.
 - d. Effect of supply of bullion on silver coinage.
- IV. Inflation and contraction.
 - a. Meaning.
 - b. Evils of sudden change: May be overcome by rates of interest.
- V. Government paper money.
 - a. Nature.
 - b. History.
 - c. Arguments for and against.
 - d. Meaning of convertible paper money. Illustrate.

MONEY AND CREDIT.

- I. Credit and instruments of credit.
 - a. Definition.
 - b. Five instruments. Teacher should secure all forms for use of class.
- II. Banks as institutions of credit.
 - a. Three functions. Illustrate each definitely by concrete examples.
 - b. Illustrate banking system.
- III. Advantages and disadvantages of credit.
- IV. Distribution of precious metals.
 - a. General distribution and acceptance.
- V. Summary.
 - a. What is money? Credit and representative money?
 - b. Effect and influence of credit.
 - c. Limitations of credit.

STEPS IN MONETARY HISTORY OF THE UNITED STATES.

- I. In 1792 Congress established a coinage system.
 - a. Silver and gold coins made legal tender at the ratio of 15 to 1.
 - b. This undervalued gold, as the market value of silver bullion was 15.61 to 1. Thus gold disappeared. Practically a silver basis.
- II. In 1834-'37 the silver dollar was given a pure-contents weight of 371.25 grains, gold 23.22 grains. Ratio was 15.988+ to 1. Gold was overvalued and silver disappeared. Nominally a gold standard. Note how Gresham's law applied in both instances.
- III. In 1850 gold was discovered in California. Silver dollar worth \$1.02. Fractional currency was debased.
- IV. In 1862 greenbacks were issued. Banks were forced to suspend specie payment, and thus paper money depreciated.
- V. In 1875 bonds were issued to redeem greenbacks in 1879.
- VI. Congress decides to reissue greenbacks in 1878, whether redeemed or received as taxes.
- VII. Redemption of greenbacks in 1879.
- VIII. Establishment of present national banking system in 1863-'64.
 - a. National comptroller of the currency, to whom each bank must report five times annually. Banks inspected.
 - b. Capital stock of at least \$25,000 and stockholders liable for twice the par value of the stock.
 - c. A certain portion of capital must be invested in United States bonds deposited with the treasury.

- VIII. Establishment of present national banking system—*continued*.
- d. Banks must issue notes on security of these bonds to par value of same.
 - e. These notes are not legal tender, but are acceptable for taxes, not imports. Redeemable at all banks.
 - f. Banks must deposit fund equal to 5 per cent of outstanding notes.
 - g. Banks in small cities must keep, as a reserve, 15 per cent of deposits, and may deposit 60 per cent of this in reserve banks. The latter must keep as a reserve 25 per cent of deposits, and may deposit in a central bank 50 per cent of this 25 per cent.
 - h. Banks are taxed one-half of 1 per cent on their circulation; state banks 10 per cent; hence, prohibiting their issuance of notes.
- IX. Demonetization of silver by the "crime of '73."
- X. Bland-Allison act of 1878. Who were these men?
- a. United States should purchase not more than four million and not less than two million dollars' worth of silver bullion.
- XI. Repeal by the Sherman act of 1890. Who was Sherman?
- a. The secretary of the treasury should purchase 4,500,000 ounces of silver bullion—price, one dollar for 371.25 grains—payable in treasury notes, which could be reissued. These were legal tender. An instance of borrowing money in time of peace for the mere running expenses of the government.
- XII. Repeal of Sherman act in 1893.
- XIII. Legislation of 1900.
- a. Gold was made the standard.
 - b. \$1,500,000 in gold was set aside to redeem greenbacks and treasury notes.
 - c. Secretary of the Treasury might issue bonds in case of necessity.
- XIV. Review all kinds of money, and tell what security each kind of paper money has.
- a. Gold certificates.
 - b. Silver certificates.
 - c. Greenbacks.
 - d. Treasury notes.
 - e. National bank notes.
 - f. Gold coins.
 - g. Silver dollars.
 - h. Subsidiary money.

All forms of paper money should be secured and exhibited to class.

- XV. Bimetallism.
- a. Results of national bimetallism.
 - b. Results of gold monometallism in various countries.
 - c. History of silver bimetallism.
 - d. Arguments in favor of international bimetallism.

MONOPOLIES.

- I. Nature of monopolies.
- a. Definition.
 - b. Monopoly, how fixed?
 - c. Classes: Define and illustrate each from daily experiences.
See history of Standard Oil Company in the *Outlook* of December 4, 1909.
- II. General considerations.
- a. Influence and complexity.
 - b. Real test.

- III. Problem of natural monopolies.
 - a. Private ownership and public control.
 - b. Public ownership.
 - c. Municipal ownership.
- IV. Capitalistic monopolies.
 - a. Arguments in favor.
 - b. Opposition.
- V. Final considerations.
 - a. Competition.
 - b. Reasons for success.
 - c. Future of monopolies.

RAILROAD TRANSPORTATION.

- I. Competition and combination.
 - a. Early history.
 - b. Competition.
 - 1. History of the interstate commerce movement.
 - 2. History of the Northern Securities case.
 - c. Consolidation.
- II. Rates.
 - a. History of freight rates.
 - b. Local discriminations.
 - c. Competition of routes and markets.
 - d. Unjust discriminations.
- III. Public control.
 - a. Early policy.
 - b. Later policy.
 - c. Provisions of interstate-commerce law.
 - d. Legal difficulties.
 - e. Various amendments and act of 1906.
 - f. Government ownership.

INTERNATIONAL TRADE.

- I. Foreign trade of the United States.
 - a. Character of export and import trade.
- II. International commerce.
 - a. Mechanism.
 - b. Exchanging.
 - c. Use of money and banks.
 - d. Advantages.
- III. International values.
 - a. Immobility of labor and capital.
 - b. International trade.
- IV. Restriction of international trade.
 - a. Customs or duties.
 - b. A tariff for revenue.
 - c. A tariff with incidental protection.
 - d. History of protective tariffs. Instructor can show this nicely by means of a graph.
 - 1. Effects.
 - 2. Relation of tariff to wages.
 - 3. Justification for a protective tariff.

LAND NATIONALISM.

- I. Land nationalism.
 - a. English Land Tenure Reform Association.
 - b. Henry George and the single-tax theory.
 - c. His plan of land nationalization.

II. Socialism.

- a. Definition.
- b. Cardinal elements.
- c. Compare with George's theory.
- d. Misuse of socialism.
- e. Early rise of socialism.
- f. Objections.
- g. Justification of our present system.

ECONOMIC FUNCTIONS OF GOVERNMENT.

I. Functions performed by the government.

- a. Importance.
- b. Former and present views.
 1. The mercantilists.
 2. Views of Adam Smith.
 3. *Laissez faire* theory.

II. Modern theories of governmental functions.

- a. Anarchism.
- b. Different views of individualists.
- c. Socialists.

III. Functions of government as considered by individualists.

- a. Five classes of functions.
- b. The question of government control.

GOVERNMENTAL EXPENDITURES AND REVENUES.

I. Public expenditures.

- a. Classifications. (The teacher should obtain a tax receipt for the present fiscal year, and show the class for what purposes all direct taxes are used.)
- b. Growth.

II. Public revenues.

- a. Six main branches of income.
- b. Purpose and methods of taxation.

III. Taxation.

- a. Customs.
 1. Specific.
 2. Ad valorem. Illustrate each form with concrete examples.
 3. Method of collection.
- b. Excise.
 1. History.
 2. Method of collection.
- c. Taxes on transactions.
- d. Poll taxes.
- e. Property tax: Difficulties arising.
- f. Corporation taxes.
- g. Licenses.
- h. Inheritance tax: Difficulties arising.
- i. Income tax.
 1. Legal difficulties.
 2. Method of administration.
- j. Part taken by nation, state and local units in taxation.

CITIZENSHIP.

One-half unit.

For a number of years civics has not had a prominent place in the curriculum of Kansas high schools. A more or less critical study of the constitution of the United States represents the character of work done in those schools which maintain classes in civics. Latterly this subject has been placed in the junior or senior year. For the two reasons stated, the vast majority of high-school pupils are no longer afforded an opportunity to study the constitution, and very little training is offered in the elements of citizenship. The consensus of opinion now appears to be that larger stress should be placed upon this important subject, and that early in the high-school course pupils should be taught the fundamental principles and duties of citizenship. This does not necessarily mean the conventional study of the constitution, but is intended to cover a discussion of individual rights and the basic principles upon which any true democracy must rest.

A most excellent text in this subject and one well adapted to this grade of work is "Training for Citizenship," by Smith, published by Longmans, Green & Co.

LATIN.

Four units.

Two, three or four of the following units may be offered:

1. The Beginner's Book.
2. Four Books of Cæsar, or an equivalent, and Latin prose composition.
3. Six orations of Cicero, or an equivalent, and Latin prose composition.
4. Six books of Vergil's *Æneid*, or an equivalent.

A full year must be given to each of these units. No credit should be given for less than one unit. If three units are offered, it is preferred that they be 1, 2 and 3; but 1, 2 and 4 may be accepted. No combination of Cicero and Vergil should be counted as one unit.

The foregoing statement is in complete harmony with the report of the Commission on College Entrance Requirements, appointed by the American Philological Association. That report has been accepted by the great majority of good institutions all over the country, and has been officially adopted as its own by the North Central Association of Schools and Colleges. The report is formulated in terms which apply directly to those institutions which admit only on examination, but is intended also for those which admit on certificate. The report follows:

REPORT OF COMMISSION ON COLLEGE-ENTRANCE REQUIREMENTS IN LATIN.

I. Amount and Range of the Reading Required.

1. The Latin reading required of candidates for admission to college, without regard to the prescription of particular authors and works, shall be not less in amount than Cæsar, Gallic War, I-IV; Cicero, the orations against Catiline, for the Manilian Law, and for Archias; Vergil, *Æneid*, I-VI.

2. The amount of reading specified above shall be selected by the schools from the following authors and works: Cæsar (Gallic War and Civil War) and Nepos (Lives); Cicero (orations, letters, and De Senectute) and Sallust (Catiline and Jugurthine War); Vergil (Bucolics, Georgics, and *Æneid*) and Ovid (Metamorphoses, Fasti, and Tristia).

II. *Subjects and Scope of the Examinations.*

1. *Translation at Sight:* Candidates will be examined in translation at sight of both prose and verse. The vocabulary, constructions, and range of ideas of the passages set will be suited to the preparation secured by the reading indicated above.

2. *Prescribed Reading:* Candidates will be examined also upon the following prescribed reading: Cicero, orations for the Manilian Law and for Archias, and Vergil, *Æneid*, I, II and either IV or VI at the option of the candidate, with questions on subject-matter, literary and historical allusions, and prosody. Every paper in which passages from the prescribed reading are set for translation will contain also one or more passages from translation at sight; and candidates must deal satisfactorily with both these parts of the paper, or they will not be given credit for either part.

3. *Grammar and Composition:* The examinations in grammar and composition will demand thorough knowledge of all regular inflections, all common irregular forms, and the ordinary syntax and vocabulary of the prose authors read in school, with ability to use this knowledge in writing simple Latin prose. The words, constructions, and range of ideas called for in the examinations in composition will be such as are common in the reading of the year, or years, covered by the particular examination.

THE BEGINNER'S BOOK.

The all-important thing in the first year is that the pupil shall acquire a perfect knowledge of the forms of declension and conjugation. This means the ability not merely to repeat the paradigms correctly, easily, and rapidly, but to recognize instantly and certainly each case and verb form when met in isolation. Vocabulary and syntax are important, too, but they can be learned in later years, while a pupil who gets through the first year without learning the forms has little prospect of ever learning them. And no pupil who has to stop and think out or look up the identity of the forms he meets in his reading can ever read easily. There is only one way to teach this command of forms, namely, drill—drill at the first occurrence of a paradigm, drill in the regular reviews, drill at unexpected times all through the year. The teacher who can not stand the drudgery of drills ought not to teach beginning Latin. Analysis into stems and endings may help some pupils a little, but it can not take the place of thorough drilling. Besides the frequent repetition of paradigms, there must be many exercises in the recognition of isolated forms, given either orally or on the board. No beginner's book gives more of these exercises than are sufficient to serve as models.

In the first year the pronunciation is fixed, and it is as easy to fix a right one as a wrong one. The Roman method is of course the only one possible at present. A perfectly accurate pronunciation requires that long vowels be given twice the time given to short vowels, whether accented or not. This is contrary to English usage, and, for this reason, is so difficult that few teachers attempt it. But it is very easy to distinguish in quality between long and short vowels, especially as most preparatory books indicate the quantities; and there can be no possible excuse for permitting incorrect accents. Requiring pupils to mark the long vowels in all written work is helpful, but will have no effect if they hear and use an incorrect pronunciation. The teacher should spare no pains in perfecting his own pronunciation; and he should always read to the class the Latin words in the next day's lesson, and make sure that every pupil knows the correct pronunciation of every word before he learns it.

CÆSAR.

If the work of the first year has been done well, Cæsar is not too difficult an author to follow the beginner's book immediately. If Cæsar is read intelligently, he is very far from being too dull and monotonous

for a year's work. Under these conditions, it is best to read, without substitution, four books of Cæsar, or selections from the entire seven books equivalent in amount to the first four. Books V-VII are more interesting than books I-IV, and the teacher who is weary of I-IV may well omit portions of them, especially I, 30-55, and substitute portions of the later books, as V, 1-24; V, 24-52; VI, 11-28; VII, 66-90. But if the teacher desires to make a partial substitution of some other author, in place of one book of Cæsar an equivalent amount of *Viri Romæ* or *Nepos* may be used. Any of the second-year books offer an acceptable substitute for Cæsar.

At the end of the second year the pupil should have an accurate working knowledge of all the common uses of the cases and modes. Therefore it is unavoidable that a drill on syntactical constructions should receive the chief attention during the reading of Cæsar. But if Latin prose composition is properly emphasized, it will carry a large part of this burden, and will leave the class some time for getting at the contents of Cæsar's story. It is a great mistake to make nothing but a grammatical drill-book out of Cæsar.

CICERO.

The six orations should include the four against Catilina, the one for the Manilian Law; and the one for the Poet Archias may be recommended as the sixth. If a partial substitution is desired, Sallust's Catiline may be read instead of the Manilian Law and the sixth oration. This gives variety in the year's work and makes the setting to the Catiline speeches more vivid.

The syntactical drill can not yet be subordinated, but it ought not to require so much time as during the second year. Pupils should make written abstracts of the speeches, so that they may get the contents of each as a whole; should be encouraged to read the Latin aloud with rhetorical emphasis; and should in every possible way be led to appreciate the fact that they are reading great speeches, not disconnected pages of Latin sentences.

VERGIL.

If the pupil has come up to the study of Vergil without a good working knowledge of declension and conjugation forms and of case and mode uses, he is to be pitied. There ought to be too much to do to permit of much grammatical drill. This is the reason why Vergil ought always to follow Cicero in the course, not precede. Opinions may differ as to whether pupils find Cicero or Vergil the more difficult, although a comparison of scholarly editions will prove that editors at least find Vergil vastly the more difficult. But while reading Cicero any teacher can find plenty of time for grammatical drill; while reading Vergil he ought not to be able to do so: and yet in his third year of Latin a pupil must have grammatical drill.

First and foremost, the pupil should get the contents of the story. Fortunately few teachers fail to let their pupils do this in Vergil, however they may teach Cæsar and Cicero. Yet an occasional college student will say that he does not know whether or not he has read the story of Æneas's descent to the lower world. Secondly, the pupil must learn to read Vergil metrically. This does not mean that he should be taught painfully to divide the lines into feet, giving a reason for each step, and then be left to imagine that he has thus "scanned" Vergil. He should be taught to read the lines as smoothly and intelligently as so much English poetry; and this is no difficult feat. Only then will he feel that Vergil wrote poetry. It is not necessary to learn all the rules of quantity laid down in the grammars. If he has been taught to discriminate between long and short vowels in his usual pronunciation he will have no trouble at all. If not, *Auxilia Vergiliana*, a little pamphlet published by Ginn & Co., shows how a few rules, well used, will carry him through almost all lines;

and an occasional reference to the vocabulary will clear up the rest. If the teacher is a convert in theory to the doctrines of Hale or of Bennett, let him nevertheless begin by teaching the old-fashioned way, with an ictus on the first syllable of each foot, and no word accent. Few pupils will make music of Vergil's verse on any other plan. Thirdly, the pupils ought to learn a good deal of mythology—not theories about the origin and meanings of the gods, but the stories which form so integral a part of much of our English literature. In addition to these main topics, there are innumerable questions on matters literary and archaeological which will occur to the teacher who knows the literature of his subject. Many of these will serve to interest and stimulate the pupil.

LATIN PROSE COMPOSITION.

Although the goal in the study of Latin is the ability to read, rather than to write, the language, yet accurate reading is impossible without a good command of vocabulary, form, and syntax; and this can be acquired by no other method so surely and quickly as by the writing of Latin.

No manual of prose composition has been provided for in the text-book law, and the teacher may therefore choose the one best adapted to his needs. There are two systems in vogue. Such books as Jones's *Exercises in Latin Prose Composition* (Scott, Foresman & Co.) and Bennett's *Latin Composition* (Allyn & Bacon) take up the principles of syntax in logical order, as they are given in the grammars, and give sentences which call for the practical use of these principles. Their chief purpose is to insure a systematic study and comprehension of the syntactical portion of the grammar. Such books as Daniell's *New Latin Composition* (Sanborn & Co.) and Moulton's *Preparatory Latin Composition* (Ginn & Co.) base their exercises closely on the texts of Cæsar and Cicero, so that the pupil uses the words and constructions found in the portion of the text just read. Their chief merits are that they give practice in writing connected passages as well as disconnected sentences, and they encourage the pupil to study closely the text he is reading. But these merits seem outweighed by the fact that they are necessarily less systematic in presenting the principles of syntax, although the editors usually attempt with some success to remedy this defect. If a specific recommendation is desired, our preference would be for the whole of Bennett, supplemented, if possible, by frequent exercises dictated from a book of the other type. This amount is not too large for the best interests of the pupil, since the more composition is emphasized the less needful it is to make mere grammatical drill-books of the Latin authors.

The equivalent of one period a week should be given to composition throughout the second and third years. Individual experience must determine how this shall be divided. The most usual method, and perhaps the best, is to give it one period a week. Sometimes it is scattered out, so that a little is done every day; but this is likely to make the work too scrappy and to lead to its neglect. A few teachers spend several weeks together on composition alone, usually at the end of the year, and justify the plan on the ground that it interests the pupils more. This is no doubt true. The dislike felt by most pupils for composition is largely or wholly due to the fact that they do so little of it that it never becomes easy. But it must be remembered that composition is practiced as an aid to reading, and this aid is lost unless the reading is carried on side by side with the writing.

If such a book as Daniell's is used, the exercise assigned should always be the one based on the portion of the text just read by the class, even if some exercises have to be omitted. To let the writing lag far behind the reading defeats the purpose of the method.

TRANSLATION.

If translation is done well it is a better training in English expression than can be obtained from original composition on the part of the pupil; for in original composition he can usually avoid expressing at all any idea which he can not express easily, while in translation he is forced to give expression to every idea of his author. There is therefore a sad waste of opportunity if the teacher allows himself to be satisfied with slipshod, slovenly translation. Yet the mistake is prevalent, for "translation English" has become a synonym for a certain kind of language which is never heard outside of the classroom except for humorous effect. It consists in part merely of the overworking of some very good words and phrases. A modern general might sometimes urge or encourage his men; Cæsar always "exhorted" his. We sometimes can not do things; the ancients were always "unable" to do them. A worse feature of "translation English" consists of so-called "literal translations" of Latin idioms. Some teachers even require such renderings, although monstrosities like "he said himself to be about to go" are not English at all, and therefore are not translations. A good classroom translation must be good English, and should at the same time show the disposition made of each word of the original. If one quality must be sacrificed let it be the latter, and let the teacher satisfy himself by questions that the pupil understands the Latin. But the pupil can not always make a good translation unaided, even if he understands the Latin. This is the best reason for invariably reading the review lessons. On the advance lesson he must be expected to stumble and must be helped. But on the next day he should be required to read through the lesson as smoothly and as perfectly as if he were reading so much English.

Too many teachers unconsciously have the habit of correcting translation by interjecting words and remarks while the pupil reads. If the pupil has prepared what he considers a good translation, this practice both irritates and discourages him. If he has not, it encourages him to prepare his translation in a slipshod way, trusting to hints from the teacher to carry him through. In either case, neither the pupil who recites nor the rest of the class can fit the teacher's suggestions into the pupil's translation. The pupil should always be allowed to read through, without suggestion, the portion assigned him, whether a sentence or a paragraph. The teacher should then comment on his mistakes, and finally should translate the whole properly.

SUBJECT MATTER.

A very common and very unfortunate defect in teaching is a failure to make sure that the pupil gets a good understanding of the subject matter of the Latin authors. To take Cæsar, for example. Many pupils, many teachers even, find him dull and monotonous. No person could ever hold this opinion if he knew just what Cæsar did in each of his campaigns, and had taken the pains to study out his routes, his battle-fields, his methods, and his motives. But no history ever written would be interesting if read at the rate of half a page a day and studied solely from the point of view of his syntax. The language of Cæsar must be the main object of attention; but the pupil ought to know the story as he reads it, ought to appreciate the bearing of every new chapter on the whole, ought to trace out all the movements on the map. The failure to get such an understanding makes the author dull, makes it harder to secure an adequate translation of the passages assigned for the daily lessons, and leaves the pupil at the end of his year's work with no comprehension that he has been reading one of the world's great classics. If the average teacher feels satisfied that his pupils are getting such a knowledge of the subject matter of the authors they are reading, he can easily test his results by an examination question. At the end of any book of Cæsar let him ask his class, without previous warning, to write out a narrative of the campaign. To judge by what most college stu-

dents remember of the contents of the preparatory authors, he will be surprised at the answers, if he gets any.

The surest and best method of giving pupils this knowledge of the subject matter is requiring them to write out in notebooks brief summaries of each day's lesson, as a part of the next day's work. This should be supplemented by brief discussions, and by questions during the daily recitations and in examinations. It goes without saying that the teacher himself must have a full comprehension of the subject matter; and this he certainly will not have unless he makes a practice of reading at a sitting a whole campaign of Cæsar, a whole oration of Cicero, or a whole book of Vergil. He will be much helped, too, by reading one or more of the books which are mentioned later.

SIGHT READING.

Sight reading has its value, though it has been overestimated. It is not worth doing at the expense of other things; but if there are a few minutes to spare at the end of the recitation, they may be well employed by letting the class read on into the next day's lesson without using either notes or vocabulary. This is better than taking Latin from some other source, because what is learned is fixed in the memory when the pupils read the passage again in preparation for the next day's recitation, and because it insures the attention of the whole class.

The teacher should not be misled by the importance given to translation at sight in the report of the Commission on Entrance Requirements. The Commission was dealing with examinations, not class practice. It did not wish a larger portion of the class period devoted to sight reading. It did wish the pupil to show that he had gained power by his study of Latin. The best method of preparing for such tests as the Commission intended is by thorough drill and hard work of the good old-fashioned kind.

JOURNALS.

Every teacher of Latin should be a member of the Classical Association of the Middle West and South. The membership fee of two dollars entitles the member to receive two journals—the *Classical Journal*, which is the official organ of the association, and *Classical Philology*, which is more technical. The fee may be sent to Prof. H. J. Barton, Champaign, Ill., who is treasurer of the association. The *Classical Weekly*, the organ of the Classical Association of the Atlantic States, may be obtained by sending one dollar to Prof. Charles Knapp, Barnard College, New York.

BOOKS.

The following list contains a few of the books which will be found most useful in the library of the high school or the teacher; the prices are quoted from the Publishers' Trade List Annual:

Cæsar.—Holmes, *Cæsar's Conquest of Gaul* (Macmillan & Co., \$6.50); the best discussion of the military and geographical problems in *Cæsar*. Fowler, *Julius Cæsar* (G. P. Putnam's Sons, \$1.50); perhaps the best life of *Cæsar*. Judson, *Cæsar's Army*, Ginn & Co., \$1.

Cicero.—Boissier, *Cicero and his Friends* (G. P. Putnam's Sons, \$1.75); Forsyth, *Life of Cicero* (Charles Scribner's Sons, \$2.50).

Vergil.—Conington, *Vergil* (Macmillan & Co., 3 vols., each \$3.25); the best English edition; volume II contains *Æneid I-VI*. Conington, *Vergil's Poems in Prose* (Longmans, Green & Co., \$2). Dryden, *Translation*, several editions. Sellar, *Vergil* (Oxford Press, \$2.25); the best literary criticism. Glover, *Studies in Vergil* (Edward Arnold, \$2.25); most helpful and suggestive.

Grammars.—The teacher should have all the grammars commonly referred to.

Lexicons.—Harpers' Latin Dictionary (American Book Company, \$6.50). Lewis, Elementary Latin Dictionary (American Book Company, \$2). White, English-Latin Dictionary (Ginn & Co., \$1.50).

Dictionaries of Antiquities.—Harpers' Dictionary of Classical Literature and Antiquities (American Book Company, \$6 to \$10). Seyffert, Dictionary of Classical Antiquities (Macmillan & Co., \$2.25). One or the other of these books is almost indispensable.

Atlases.—Ginn's Classical Atlas (Ginn & Co., \$1.25 to \$2). Kiepert, Atlas Antiquus (Sanborn & Co., \$2.50). Sanborn's Classical Atlas (Sanborn & Co., \$1 to \$1.75).

Wall Maps.—Kiepert, get price-list from Rand, McNally & Co. The best and most expensive.

History.—(See the department of history.)

Histories of Literature.—Cruttwell, History of Roman Literature (Charles Scribner's Sons, \$2.50). Mackail, Latin Literature (Charles Scribner's Sons, \$1.25); this is itself a work of literature.

Mythology.—Gayley, Classic Myths in English Literature (Ginn & Co., \$1.50). Guerber, Myths of Greece and Rome (American Book Company, \$1.50).

Miscellaneous.—Bennett and Bristol, The Teaching of Latin and Greek (Longmans, Green & Co., \$1.50). Fowler, Social Life at Rome (The Macmillan Company). Hale, Art of Reading Latin (Ginn & Co., 25 cents). Johnston, Private Life of the Romans (Scott, Foresman & Co., \$1.50). Johnston, Teaching of Second-year Latin, (Scott, Foresman & Co., free). Kelsey, Latin and Greek in American Education (The Macmillan Company, \$1.50).

GREEK.

Three units.

1. Elementary Greek. Gleason's Greek Primer or White's First Greek Book, or an equivalent. Thorough mastery of declensions and conjugations, and the main ideas of syntax. Xenophon's Anabasis begun, and twenty to thirty pages read. Goodwin's, Babbitt's or Goodell's Greek Grammar.

2. Xenophon's Anabasis continued into or through the fourth book, or an equivalent amount of other Attic prose. Review of inflections. Systematic study of syntax in the grammar. Practice in writing Greek based on the text read. Constant training in sight reading.

3. Homer's Iliad or Odyssey, five or six books, exclusive of the Catalogue of Ships. Special attention to Homeric forms, vocabulary, and scansion. Constant practice in reading at sight. Seymour's School Iliad or Benner's Selections from Homer's Iliad. Perrin & Seymour's School Odyssey (edition with eight books). Attic prose composition once a week. Bonner's Greek Composition for schools.

SUGGESTIONS TO TEACHERS.

Special attention should be paid to the regular forms and constructions, the most common words and phrases and principles, leaving the irregular or uncommon to be learned when they occur in reading. Require a firm grasp of the essentials. Review and repeat, but not to weariness. Go slowly at first, yet aim to get results as fast as possible.

Help students to acquire a vocabulary, by grouping words when possible, by bringing out the English derivatives, by having them mark, in both text and grammar, words or principles especially to be learned, and then review them often. Don't allow a student to turn to his lexicon or grammar to look up a word or principle until he is sure that it is

necessary. Have him, if possible, originate some device of his own to remember the meanings of words.

Go over as much as possible of the advance lesson each day. Have students pronounce and translate at sight; watch and teach or guide them how to read, leading them to bring forth and apply meanings of words and forms and principles of syntax they have already had and know. Explain as much as necessary, but leave something for them to do.

Have students translate the words of a sentence in the order in which they stand in the original, and make good English afterwards. In reading poetry let them use a poetic order.

Use the blackboard much; let the students see what is necessary.

Yet train the ear also. Have some oral work every day. Have students pronounce aloud, and let them translate some from hearing, especially passages already translated from the book. If possible, introduce some conversational exercises, and have students learn some Greek by heart.

Require a knowledge of the geography, history and mythology needed to understand the author being read, and something of his life, time and works.

A few books that ought to be at command of students and teachers:

Lord's Classical Atlas, Boston, Sanborn, \$1 to \$1.75.

Botsford's History of Greece, New York, Macmillan, \$1.10.

Bury's History of Greece, New York, Macmillan, \$1.90.

Pennell's Ancient Greece, Boston, Allyn & Bacon, 60 cents.

Butler's Story of Athens, New York, Century Company, \$2.40.

Jebb's Primer of Greek Literature, New York, Appleton, 40 cents.

Capp's Homer to Theocritus (a history of Greek literature), New York, Scribner's, \$1.50.

Jebb's Homer, an Introduction to the Iliad and Odyssey, Boston, Ginn, \$1.12.

Goodell's Greek Lessons, New York, Holt, \$1.25.

Gulik's Life of the Ancient Greeks, New York, Appleton, \$1.40.

Harpers' Dictionary of Classical Literature and Antiquities, New York, Harpers, \$6 to \$10.

Liddell & Scott's Greek Lexicon, New York, American Book Company, \$10.

Hill's Illustrations to School Classics, New York, Macmillan, \$2.50.

Tarbell's History of Greek Art, New York, Macmillan, \$1.

Schuchhardt's Schliemann's Excavations, New York, Macmillan, \$4.

Tsoudas and Manatt's Mycenæan Age, New York, Houghton, Mifflin & Co., \$6.

Mycenæan Troy, Tolman and Scoggin, New York, American Book Company, \$1.

Weissenborn's Homeric Life, New York, American Book Company, \$1.

Leaf and Bayfield's Iliad with notes, New York, Macmillan, 2 vols., each, \$1.40.

Moss's First Greek Reader, new edition, Boston, Allyn & Bacon, 70 cents.

Dickinson's Greek View of Life, London, Methuen, \$1.

GERMAN.

Three units.

The following statement of a standard high-school course in German was prepared by a committee of five, Prof. H. O. Kruse, of the University of Kansas, chairman, appointed in 1910 at the annual meeting of German teachers. Acknowledgments are made by the committee to Professors Todd, of Washburn College, Carruth of the University of Kansas, Evans, of the Ohio State University, to the report of the California State Teachers' Association, the bulletin of the University of Wisconsin, and the report of the Committee of Twelve of the Modern Language Association of America.

PURPOSE OF GERMAN IN THE HIGH SCHOOL.

Among the purposes served by instruction in German may be mentioned:

1. The general disciplinary value of such instruction, such as: (a) The training of the analytic and reflective faculties by stimulating comparison and hence a discrimination. (b) The cultivation of precision of thought and of ~~ang of~~ ~~discont.~~ (c) The training of memory and the development of ~~the power of~~ steady application. (d) The better appreciation and comprehension of English through the study of the kindred German language.

2. The introduction to the life and literature of Germany, and the furthering of good citizenship through the knowledge and sympathy thereby gained.

3. The preparation for pursuits that require a knowledge of German.

4. The study of German may form the foundation for an accomplishment which may be of use in business and travel.

While all these purposes are legitimate and none may be entirely ignored, the limitations of the high school on the one hand, the unequal values of the ends mentioned on the other hand, necessitate the placing of the emphasis on the general disciplinary values and the introduction to the life and literature of Germany. The study of language structure is, however, a necessary approach, the spoken and written language a helpful and stimulating means, the hope of linguistic accomplishment a valuable incentive, and the possible ultimate practical application a desirable concomitant result.

PREPARATION FOR THE TEACHER OF GERMAN.

It is desirable that the teacher of German shall himself be a master of the German language, with all that this implies. He should therefore be able to read, write and speak the language with ease and accuracy; should have a fair knowledge of its historic development and its relation to other languages of the Teutonic group; should have a fair knowledge of the literature and history, the life and customs of the German people; should adequately appreciate the Germans and their significance in the world; and as all this can not well be secured adequately in any other way, he should have spent some time among the Germans in Germany.

It is needless to say that this ideal preparation for the teacher of German in the high schools is practically unattainable, since geographical conditions make the attainment too expensive; while low salaries and uncertain tenure do not offer sufficient incentives for the attainment of this ideal. However desirable this ideal preparation may be, and however worthy of efforts at attainment, the fixing of a minimum is more likely to be of immediate value. This minimum can not safely be placed below thirty-five to forty college semester hours, including the ten hours which most students of German obtain in the high school, and hence leaving a minimum of twenty-five to thirty college semester hours for the college or university courses. Among these may well be included a three-hour course designed especially for prospective teachers, which shall include a review of the elementary grammar, a treatment of the more general difficult constructions and idioms, and a discussion of purposes, aims and methods of modern language teaching. Where courses beyond this minimum are unattainable, it is urged that the prospective teacher supple-

ment his work in German by careful reading of at least an elementary text on the history of Germany, such as Henderson's or Lewis's, and one on the history of German literature, such as Priest's or Calvin Thomas's.

No teacher should be satisfied with this minimum, but should press forward toward higher attainment. Summer courses at our colleges and universities offer opportunities; books are plentiful, relatively inexpensive and easy to procure; high-school libraries are becoming more extensive and appropriations for the library more liberal. By systematic improvement of opportunities a teacher may hence in time approximate closely to the ideal preparation for the teacher of a modern language.

A THREE YEARS' COURSE IN GERMAN FOR SECONDARY SCHOOLS.

INTRODUCTORY REMARKS.

A well-rounded course in a modern language should provide for all phases of language, in reading, grammar, speaking and composition, but as all of these are needed with the language, and hence are interrelated, this relationship should be borne in mind even when, for pedagogical reasons, the emphasis is placed on any one of them. After the preliminary lessons on forms and structure of German words and sentences, reading will most readily form the basis of the instruction and may furnish most of the material for speaking and composition.

FIRST YEAR.

PRONUNCIATION.

German should be taught as a living language, and hence at the outset great attention should be paid to correct pronunciation. Pupils should be trained to imitate the correct sounds as exemplified in the best pronunciation of the teacher, not to substitute the nearest equivalent in the pupil's English. At times it will be advantageous to call attention to the manner of producing the sound in question and to contrast the same with the nearest equivalent in English. The teacher ought therefore to have a correct pronunciation and at least an elementary knowledge of phonetics, such as may be obtained from Grandgent's German and English Sounds, Vietor's German Pronunciation, or Hempl's German Orthography and Phonology. The pupil's attention should from the outset be directed to certain differences between English and German sounds and their production, such as the following:

1. The muscles at the mouth are more active in German than in English, and hence the vowel sounds are more clear and distinct in German. The protrusion of the lips in the sounding of round vowels is especially noticeable, and only in this way can the umlauts of *o* and *u* be sounded.

2. The tongue is likewise more active, more tense, and has greater range of motion in the production of German sounds, and hence wide, low and mixed vowels are relatively rare in German. Single vowels are single sounds, whereas in the English they are sometimes diphthongs.

3. German final vowels are longer than in English and final *e* is never silent.

4. Some German sounds have no equivalent in English, such as the *ch* sounds, the umlauts of *o* and *u*, and one of the sounds of *g*.

Careful drill on sounds similar but not identical in the two languages is hence very essential, as also careful drill on sounds found only in the German. While such drills are especially needed at the beginning of the course, they should be continued until the pupil's pronunciation is generally satisfactory, and no mispronunciation should escape correction. It should also be remembered that pronunciation is not a matter of word alone, but also of entire phrases and sentences, the pronunciation of words varying with different associations.

As pronunciation is more a matter of imitation than of scientific insight into the relation of sounds, no formal instruction in phonetics is recommended, but some knowledge of phonetics on the part of the teacher may sometimes enable him to correct faulty pronunciation in the pupil.

THE SCRIPT.

Some educators doubt the advisability of German script for American schools, but so long as the Germans quite generally use it, American schools do not seem to have a choice in the matter, and hence it is recommended that the German script be used from the outset, and continued through the first three semesters. The specimens contained in the grammar text will be found quite adequate.

VOCABULARY.

The acquisition of a sufficient vocabulary is of the utmost importance, and hence a few suggestions may not be amiss. In general, the memorizing of disconnected word lists is not to be commended, since the meaning of many words will depend upon the context. But some memorizing is necessary, especially at the beginning, in which case it is well to arrange the words in grammatical, if possible also in logical, categories, nouns always with the definite article, to fix the gender. Constant reference to the relation between English and German words should be made; and simple rules and exercises on German word building will also prove valuable, as the pupil will gradually learn to trace German words from the corresponding English cognate, and *vice versa*, and to derive the meaning of a compound word by analysis of its component parts, and even to trace a group of related words from the common stem found in one of them. The study of synonyms and antonyms will also furnish interesting matter for the extension of the vocabulary. On the whole, however, words are best learned in connected sentences as they occur in carefully selected reading matter, the range of which is within easy reach of the average memory. Exercises like those suggested under the heads of reading, grammar, speaking and composition should prove valuable, and as an efficient test of acquired vocabulary and an excellent means of fixing the same, sight reading is to be recommended.

READING.

While more or less disconnected sentences at first answer the purposes of reading, connected prose selections should be placed before the pupils as soon as possible and expedient. This may be done as soon as the declension of nouns and adjectives, the conjugation of the most useful words of both weak and strong conjugations, and the most needed rules governing word-order have been studied. (Fifteen lessons in the state text, Otis-Carruth Grammar.) New forms and constructions may be treated as they occur in the reading. The selections should at first be simple and should only gradually increase in difficulty. It may be most profitable to alternate the reading lessons with those in the grammar, until the limit prescribed for the year is reached. As the pupil's knowledge of forms and constructions increases, the discussion of grammatical forms may be gradually reduced, and the emphasis shifted more to the story and its characteristically German qualities. With the growing knowledge of German there may also come a decrease of translation into English, though it is always safe to require the translation of difficult passages and to make use of translation as one of the readiest means of ascertaining exactness of knowledge and thoroughness of preparation. Instead of constant translation it is suggested that the teacher determine by skillful questioning on the content whether the preparation has been adequate and the comprehension of the passage sufficient. As the development of the pupil permits, these questions should be asked in German, and as soon as possible answers in German should be required. After this thorough discussion of the lesson, the lesson or the more important passages selected from it may be read by the members of the class or in con-

cert with the assistance of the teacher, care being taken not only to pronounce the words correctly but also to bring out the meaning of the passage in the reading.

In the selection of the reading matter for the first year care should be taken not to grade too steeply. Too difficult reading matter compels the constant use of the grammar and the dictionary, and hence tends to deaden interest, whereas easy reading matter inspires confidence and arouses interest. The best results may hence be obtained by fairly rapid reading of gradually increasing difficulty. Care should, however, be taken not to sacrifice thoroughness to ease of attainment.

GRAMMAR.

Some teachers prefer the inductive method for the study of grammar, because it has the advantage of furnishing models for future reference and seems the more natural method, since grammar is merely the classification of facts regarding language. This method, however, requires much time and great skill on the part of the teacher, and even under most favorable circumstances it is likely a small minority of the pupils will discover the laws of the language, the majority being satisfied with the mere chronicling of results. Generally speaking, it will therefore be best to give the statement of the grammatical fact first, and then illustrations in well-selected examples. The connection between grammar and language should always be borne in mind; "living grammar" should be emphasized; the application of grammar in actual German sentences should be constantly and plentifully made. Questions on the reading should therefore be so skillfully put as to bring out the form or construction desired in actual German sentences, and even paradigms may be treated in this manner. Thus, in connection with the formal declension of the word "Schüler," the following questions on the part of the teacher will readily bring the desired responses from the pupils:

Wer ist in dem Schulzimmer? Der Schüler ist in dem Schulzimmer.

Wessen Buch hat der Lehrer? Er hat das Buch des Schülers.

Wem giebt der Lehrer das Buch? Er giebt es dem Schüler.

Wen lobt der Lehrer? Er lobt den Schüler.

Drills of this nature will be found especially valuable in fixing the proper use of possessives, infinitives, etc. For example:

Ich studiere meine Aufgabe, du studierst deine Aufgabe, er studiert seine Aufgabe, sie studiert ihre Aufgabe, wir studieren unsere Aufgaben, etc. Ich fange meinen Brief an, du fängst deinen Brief an, etc. Ich schäme mich meines Freundes nicht, du schämst dich seiner nicht, wer wird sich seiner Eltern schämen? etc.

Similarly, in response to the questions: Was tun Sie? Was taten Sie? Was werden Sie tun? Was haben Sie getan? the corresponding responses may be readily elicited: Ich schreibe einen Brief, Ich schrieb einen Brief; Ich werde einen Brief schreiben; Ich habe einen Brief geschrieben.

Word-order may be treated similarly, for example: Was tut der gute Schüler? Der gute Schüler lernt seine Aufgabe. Was hat der gute Schüler getan? Der gute Schüler hat seine Aufgabe gelernt. Was werden Sie morgen tun? Morgen werden wir mit unserem Onkel auf das Land hinaus fahren. Auch wollen wir morgen in die Stadt gehen, wenn es nicht regnet. Was tat sie? Sie schrieb einen Brief an ihre Tante. Was tat sie nachdem sie den Brief an die Tante geschrieben hatte? Als sie den Brief geschrieben hatte, las sie ihn ihren Freundinnen vor.

Exercises of this nature tend to fix grammatical forms and also serve the purpose of speaking or oral exercises.

The grammar for the first year should include: inflection of nouns, articles, adjectives, verbs; the simpler uses of the subjunctive, modal auxiliaries, the more common prepositions, and the more important rules governing word-order. In the state text this is equivalent to the first twenty-two lessons, with some additional study of word-order, passive voice and reflexives as needed in the reading or translation. The complete treatment of the last-mentioned topics, and others not here mentioned, should be postponed to the second year.

SPEAKING.

Speaking and composition involve similar mental processes, but differ widely in extent and intensity of training. Proficiency in a language is largely a matter of practice, and as the oral use of the language makes possible a greater amount of practice than the relatively small quantity of written work possible, the superiority of speaking over composition must be evident, especially when it is remembered that the pupil can get familiarity with the foreign language, can develop a "Sprachgefühl" only by constantly hearing and speaking the foreign language to be mastered.

As speaking is largely a matter of imitation, it should, on the whole, be based on material previously studied. Carefully framed questions should induce the pupil to make use of the forms and expressions which his training has given him. At first this must consist largely of rearrangement of the few phrases at command, of variations in person, tense and number; but gradually greater freedom of expression may be expected, especially after the pupil begins to think in German instead of translating all the German into English. Aural practice in German should not be introduced spasmodically, but should be regularly employed from the outset, preferably in connection with the German exercises, and later with the reading matter. Some teachers, however, find it of advantage to base at least a part of the speaking on some text in dialogue form, such as the recently published "Im Vaterland," which has the advantage of also introducing the pupils to the life of Germany. If used as a supplementary text, it may be begun late in the first year, but its chief value would be in the second year of the German course. Wherever possible the teacher should himself arrange and guide the speaking, but he may at times find valuable suggestions in such works as Walther's Lessons in German.

TRANSLATION.

While the ultimate end of the instruction in German is to attain to complete comprehension of written and spoken German directly and not through the medium of the English, yet during the earlier stages of the work advantage should be taken of the knowledge the pupil already possesses, and which will be serviceable in the study of the new language. The restatement in one language of a thought expressed in the other is therefore valuable for the purpose of securing full comprehension and giving opportunity for the application of the knowledge gained. Accurate and faultless translations of the exercises of the grammar text should therefore be required, care being taken to express the thought in idiomatic English or German as the case requires. After reading is begun, translation may be gradually reduced as suggested above under the head of reading, though difficult passages should still be translated, while the pupil's comprehension of easier passages is tested by skillful questioning. With increasing knowledge of German the necessity for translation into English grows less, though throughout the high-school course it is always safe to translate passages with difficult constructions and to make use of translation as a test of the pupil's comprehension and an incentive toward careful and sufficient preparation.

COMPOSITION.

In the earlier stages composition is best based on familiar material. It may consist in writing answers to questions on familiar passages in the reader; later free reproduction may be substituted, or the text may be reproduced with suggested changes in tense, number, person. Some of the readers and edited texts seek to meet these requirements in appended exercises. Where this is not the case the teacher may supply original exercises. To focus attention and force the pupil to the use of more difficult constructions than those he would choose without special direction, the translation into German of set sentences will be useful.

DICTATION.

Dictations serve a useful purpose in training the ear to catch the German sounds, the eye to translate them into corresponding German written characters. Dictations should be based on easy matter, preferably on matter already familiar to the pupils. They should be short, so as not to become tiresome.

MISCELLANEOUS SUGGESTIONS.

From the beginning attention should be called to the relation between German and English. Acquaintance with the salient facts of Grimm's Law will often aid in recalling words or identifying new ones. The introductory lesson in the grammar adopted for this state lends itself admirably to this purpose, and the introduction to "Glück Auf" is also quite suggestive. The purpose in this should, of course, be to facilitate the acquisition of German, not to teach philological facts.

The memorizing of short and interesting passages or verses of poetry of intrinsic value is to be commended. Among these should be a number of German songs, which when recited and sung serve not only linguistic purposes, but also create somewhat of a German atmosphere for the pupils.

THE SCOPE OF THE FIRST YEAR'S WORK.

The work of the first year should cover the first twenty-two lessons of the Otis-Carruth grammar and from fifty to seventy-five pages of reading matter, depending on the difficulty of the selections read. In addition some sight reading should be done, to test the student's grasp of the language, to give him self-reliance, and to train him in intuitive understanding. For this purpose some of the easier selections of the reader or supplementary reading matter may be reserved. Oral work should accompany the reading exercises, as suggested above, and translation into German should be required not only in connection with the grammar, but to some extent also in the reading exercises, to give training in the more difficult constructions. Some German songs should be memorized, and sung in class.

SECOND YEAR.

Much of what has been said concerning the teaching of German during the first year applies also to the second year, and hence the following suggestions are largely supplementary in character.

READING.

During the first half year three of the five recitations per week can most advantageously be devoted to reading, and this time should probably be increased to four periods during the second semester. The reader or such portions as are most valuable can thus be completed during the first semester, and some schools will find time to do some supplementary reading in addition. The best reading matter for the second semester—a total of 150 to 200 pages—will, on the whole, be short stories or novelettes, care being taken not to grade too steeply, and to select stories distinctly German in spirit, even where the plot is located outside of Germany. Translations into German, such as Schiller's *Der Neffe als Onkel*, or stories reflecting the life and spirit of non-German surroundings, such as some of the Italian tales of Heyse, should for the most part be avoided.

The choice of reading matter for the second year brings up the question as to the proper place of Schiller's *Wilhelm Tell* in the high-school curriculum. That *Tell* should find a place in the curriculum is quite generally conceded, and, on the whole, the logical place for it seems to be in the third year of high-school German, but no definite recommendation to this effect is here made, owing to great diversity of practice in the high schools, colleges and universities of the state, and the rather commendable desire on the part of the high schools with only a two years' German course to introduce the pupils to this excellent classic. It seems

best, therefore, to outline the work of the second and third years with references to existing conditions.

I. *Second-year German without Tell—Tell in Third year.*

First semester:

Reader completed as far as desired.

Supplementary reading, selected from the following:

Blüthgen—Das Peterle von Nürnberg.

Volkman—Leander-Träumereien.

Zschokke—Der zerbrochene Krug.

Spyri—Moni der Geissbub.

Hillern—Höher als die Kirche.

Second semester (150 to 200 pages):

Storm—Immensee; Pole Poppenspüler.

Stökl—Alle Fünf.

Frommel—Mit Ränzel und Wanderstab.

Heyse—Die Blinden.

Wildenbruch—Neid, Kindertränen; Der Letzte.

Rosegger—Der Lex von Gutenhag.

Gerstacker—Germelshausen.

Riehl—Burg Neideck.

II. *Second-year German with Tell in Second Year.*

First semester as above.

Second semester:

Schiller—Wilhelm Tell.

An additional short story if time is left.

The list of texts given here is merely suggestive, and is subject to future revision as experience will dictate or the publication of new texts will make desirable.

GRAMMAR.

After a rapid review of declension, conjugation and the use of modal auxiliaries, the remaining topics of the grammar are to be studied and the translation exercises provided for in the state text should be carefully done. With the exception of the chapters on the use of infinitives, participles and particles, this work should be completed during the first semester. During the second semester these chapters should be treated and the more difficult topics of the grammar, such as the modal auxiliaries and the subjunctive mode, may well be reviewed. Two recitation periods per week throughout the first semester should suffice for the work thus outlined, while the review suggested for the second semester may be given during the one recitation period set apart for composition, etc., or else in connection with the reading, for which purpose a portion of the reading, eight to ten lines daily, may be set apart for intensive study. At times a longer passage may be set apart for the intensive study of some grammar topic.

ORAL WORK AND COMPOSITION.

Oral work should be a part of every reading lesson, not only to test the pupil's knowledge and to bring out the important points in the lesson, but also to give opportunity for the use of German, which will tend to make the language more real, to invest the recitation with a German atmosphere, and to inspire pupils with confidence. The reading text will generally furnish sufficient opportunity for oral work, especially as most texts are now edited. If a special text in dialogue form is wanted, the one mentioned above or some similar one will be useful. Such a text may be continued through the third year. To avoid undue expense to the pupils, it is suggested that a sufficient number of copies be placed in the school library. German answers to questions based on the reading should be expected, and simple reproductions and synopses may in time

be attempted with profit. No text in composition should be used in the second year, but translations into German to fix grammar and vocabulary are advisable, as also dictations based on easy reading matter. The reciting of German poems and the singing of songs should likewise find a place in the program.

THIRD YEAR.

READING.

The reading during the third year should be sufficiently rapid to insure the continuity of the story and to bring out some of the literary flavor. Thoroughness should be insisted on, and hence translations, especially of difficult passages, the consideration of difficult and unusual constructions, the intensive study of selected passages, and the consideration of historical, mythological and literary references should not be neglected. But care should be taken not to break the continuity of thought and deaden the literary interest with a superabundance of philological detail. Private readings, with reports on the same, should be encouraged, especially during the second semester, for which purpose the high school should be supplied with a small but well-selected library of German books. Such special readings should, however, not encroach too much on the pupil's time, nor should his literary interest deaden his interest in the language.

The third year is, on the whole, the best for the introduction of eighteenth century classics, and, unless previously read, Schiller's *Wilhelm Tell* should here be introduced. As *Tell* is sometimes read in the second year a double list of texts is again presented.

I. *Third-year German—Tell not previously read.*

First semester:

Schiller—*Wilhelm Tell*.

Schiller—*Das Lied von der Glocke*, or a short story.

Second semester, 275 to 350 pages, selected from the following:

Lessing—*Minna von Barnhelm*.

Möricke—*Mozart auf der Reise nach Prag*.

Seidel—*Leberecht Hühnchen*.

Heine—*Die Harzreise*.

Ludwig—*Zwischen Himmel und Erde*.

Goethe—*Hermann und Dorothea*.

Freytag—*Die Journalisten*.

Liliencron—*Anno 1870*.

II. *Third-year German—Tell in Second Year.*

First semester, 150 to 200 pages, selected from the following:

Heine—*Die Harzreise*.

Schiller—*Das Lied von der Glocke*.

Keller—*Das Fähnlein der sieben Aufrechten*.

Grillparzer—*Der arme Spielmann*.

Seidel—*Leberecht Hühnchen*.

Meyer—*Gustav Adolfs Page*.*

Jensen—*Die braune Erica*.

Second semester, 275 to 350 pages, selected from the following:

Lessing—*Minna von Barnhelm*.

Ebner-Eschenbach—*Die Freiherren von Gemperlein; Krambambuli*.*

Möricke—*Mozart auf der Reise nach Prag*.

Grillparzer—*Der arme Spielmann*.

Liliencron—*Anno 1870*.

Ludwig—*Zwischen Himmel und Erde*.

Freytag—*Die Journalisten*.

Hauff—*Lichtenstein*.

Meyer—*Adolfs Page*.

This list is merely suggestive, and subject to amendments as experience may suggest. Texts marked with an asterisk (*) are without vocabulary

so far as known. Avoid duplication of authors and texts in the choice of reading matter.

GRAMMAR AND COMPOSITION.

What has been said concerning these subjects for the second year largely applies also to the third year. Selected lines and passages may be set apart for intensive study; at specified times difficult topics in grammar may be studied, either to review points not quite clear to the class or to give the topic a more comprehensive treatment than was possible during the second year. The "cycle plan" of consecutive study of a topic with ever increasing difficulty and extension of detail has much to commend itself, and is pedagogically sound. It is an unsettled question whether a composition text should be introduced into the high-school work in German, inasmuch as free reproductions or synopses of the reading matter may furnish sufficient material for the purpose. But if a text is used it should be an easy, well-graded one, such as the texts of Harris and of Pope, and even then much of the more difficult matter should be omitted.

ORAL WORK.

More and better oral work may be expected in the third year, and hence the answers to questions on the reading matter should be more adequate, the reproduction and synopses more detailed and comprehensive, and in both more difficult constructions should gradually be employed. For this purpose it is well to set apart some ten or fifteen minutes of the recitation for intensive work.

FRENCH.

One, two or three units.

FIRST UNIT.

The elements of grammar (Fraser and Squair's French Grammar), all of part I and the irregular verbs in part II; or Grandgent's Essentials of French Grammar, through the irregular verbs, or Aldrich & Foster's Elementary French.

Great stress should be laid on pronunciation, the quality of the vowels, syllabication. To fix these principles and connect sound with spelling, brief exercises in dictation, occupying only five or ten minutes, should be introduced after the first few weeks.

As the grammars named above all offer reading material, the reader proper need not be introduced before the seventh or eighth week, at first with one or two lessons a week, then with increasing frequency as the elementary facts of the language are mastered.

This reading should cover not less than 100 pages of simple French (as in Super's Reader), and should serve a threefold purpose: Translation into good English, practice in reading aloud of French, and illustration (and hence review) of the grammatical principles set out in the rules and applied in the written exercises.

SECOND UNIT.

Completion of all the lessons in the above-mentioned grammars, with suitable written exercises at least once a week. In this manner the pupil will by the end of this period have mastered all the essentials of accidence and syntax. The reading should contribute to this end; in particular, the use of modes and tenses should be repeatedly dwelt upon in connection with the reading.

More emphasis is now to be placed on dictation, and on the speaking by teacher and pupils of simple French sentences based on their reading, the teacher sometimes also reading aloud in French for translation by the pupils. The reading should comprise from 300 to 350 pages, which

may be taken from the latter part of the reader and from such texts as Malot's *Sans Famille*, Daudet's Selected Stories, Erckmann-Chatrian's *Madame Therese*, Labiche's *le Voyage de M. Perrichon*, Sandeau's *Mademoiselle de la Seigliere*.

THIRD UNIT.

Thorough review of grammar. Composition once a week, both formal grammar exercises and résumés and paraphrases of short portions of French stories.

Suitable composition books are: Mansun's French Syntax and Composition, and François's Advanced French Prose Composition.

Reading of 600 pages in such works as Mérimée's *Colomba*; A. France's *le Crime de Sylvestre Bonnard*; Pouvillon's *Petites Ames*; George Sand's *la Mare au diable*; Pailleron's *le Monde ou l'on s'ennuie*; Loti's *Pêcheur d'Islande*; Theuriet's *Bigarreau*; Coppée's *le Pater*.

Teachers of French are advised to consult the valuable Report of the Committee of Twelve of the Modern Language Association of America.

PSYCHOLOGY.

One-half unit.

Successful teachers obey psychological laws, consciously or unconsciously. The born teacher employs what we call psychological intuition, and deftly hits the mark in his teaching. The poor teacher, from ignorance or inability, violates psychological principles. We must gain expertness where we can. All teachers should be able to recognize those relatively few elemental mental laws, which should always be observed and which only ignorance allows us to violate. A training in psychology can reveal these to us. An equally important negative service which we may expect from psychology is that it will provide us with an insight into the complexities of all educational processes, revealing teaching as a serious business and a worthy profession—a challenge to our best powers and most ingenious devices. Through such a study we should see that there is possibly an assignable reason for cases of poor spelling, poor reasoning, poor imagery in certain subjects, as geometry, poor habit-forming power, lack of concentration in attention, emotional instability, weakness of will, low speed rate in learning, or lack of transference of specific training.

The young student must realize that psychology is not child's play nor parlor entertainment. It offers special difficulties, and throws the student into bewildering confusion very often. This happens because teachers too precipitously usher the student into this new psychic world. All high-school students, before they begin psychology, have been concerned with persons, things and sensible impressions from outside objects. They are now introduced to a world that can not be sensed, nor handled, nor measured. It is intangible, elusive and complex. Here the skill of the teacher only can avoid hopeless confusion. Never in the psychology classes should mere word work, mere book talk, take the attention of the class from the real thing—their own experiences. Their own mental lives constitute the only psychological laboratory, and the good teacher is the one who can practice his students best in observing their own mental operations, a process we call introspection. Many inexpensive experiments may be easily devised for class and individual use by adapting some of the devices of the Milton H. Bradley Company, Springfield, Mass., or the Whipple Tests of the C. H. Stoelting Company, Chicago, or those suggested in Seashore's *Elementary Experiments in Psychology* and Judd's *Laboratory Manual*. The main thing is to arouse a permanent interest in the workings of the mind. As soon as some groundwork in the elements of psychology, sensation, imagery, feeling and attention, and in the special processes, such as perception, memory and reasoning, can be acquired,

the students may address themselves directly to the definite educative processes of the schoolroom.

During the whole course of this study seek at every point to develop the idea of the unitary character of the mind. The mind acts as a whole, though sometimes one phase happens to be emphasized, then another. At such times we say that we are perceiving, remembering, or reasoning, as the case may be. For purposes of study, indeed, we may single out a certain process, but all are interrelated and represented in every other. These correlations should be constantly held in mind. As an instance of this take apperception, which may profitably come in for consideration when dealing with perception, attention, interest, memory and volitional action.

Under sensation and perception bring out the part that sense experience plays in the development of the child and the need of large opportunity for the acquisition of sense material. Training in careful habits of observation will result in usable memory-images, whereas the lack of clear-cut perceptions seems to result in hampering mental efficiency all one's days.

In the very beginning stress should be laid on the fact that all thought goes over into action, and not a week of the course should be passed by without showing from some new point of view that "Whatsoever a man thinketh in his heart, so is he." Among other things, this means to the teacher that he will never bring to the pupil's attention a thought he does not want acted upon, such as rules beginning with "Don't"; and that he will never teach homonyms as such. There is as much real difference between "sale" and "sail" as if they did not sound alike.

In dealing with the chapter on "Feeling," the important thing for pedagogy is to remember that while repetition makes sensations keener and more delicate, it dulls and blunts the feelings. The wisdom of this is apparent in every walk of life. The physician and nurse become more and more skillful with every case they treat, and seem more and more callous to suffering, but no one would care for the services of one who was affected in an opposite way by much attention to the sick. This means much in pedagogy. For instance, the teacher who continually threatens is never heeded, and he who helps his pupils so much that they always turn to him instead of becoming more and more independent is a poor teacher. It is true that the best teacher is he who makes himself unnecessary.

Give large place to the study of attention and its relation to other mental processes. Note that the key to an understanding of attention, and apperception also, is found in the study of the natural and acquired tendencies of the nervous system. The focal character of attention and the fact that it is a question of more or less consciousness can be easily brought out by simple illustrations. Children are never really inattentive. The teacher's problem lies in securing their attention to the right things, in gaining for the relatively uninteresting ideas of the school subjects a proportionate share of the child's conscious energy in competition with the large mass of ideas instinctively appealing to him. In the early years only passive attention is possible. It is unnatural for the child to hold to long-continued tasks, and the teacher will show his art in graduating the burden to the increasing power of the child. Almost the whole art of the teacher lies in his skill in making the active attention of the pupil turn into a passive attention, and through a good method, which means a right handling of interest and apperception, in turning forced attention into an acquired attention that shall be strong.

Bring out the relation of attention to will. When children are trained to do the tasks of the schoolroom, we say, and rightly, that their wills are being developed, but this manifests itself as an increase of power to give active attention. The school, perhaps even more than the home, furnishes the means for training the will, for giving the ability to make a sustained effort. This, of course, is the larger part of its function.

Perhaps as important as anything in psychology is a right view of the will or action side of consciousness. Consciousness is motor. All ideas tend to result in action.

Life, and especially child life, is largely lived on the level of instinct. In great measure, the child in his development does repeat the history of the race. He has many instincts and natural interests which may be made useful in his development. The collecting or acquisitive impulse is one of these. The possibilities of play in education are far greater than are dreamed of by the uninstructed. There are a host of social instincts, such as imitation and suggestion, the acquiring of language, the gang instinct, rivalry, etc., which must be reckoned with in a scheme of education, for instincts are in one sense interests and have impelling power to sway the child for good or evil. Again, no truer insight into child life may be gained than by a study of his egoistic impulses. It is here we reach a basis for dealing with questions of a disciplinary character.

The following outline follows the order of presentation of Betts's "The Mind and Its Education," which is suggested as the text:

- I. The mind, or consciousness.
 1. How we may come to know mind.
 2. Its personal character.
 3. Introspection the one means of study.
 4. Consciousness like a stream.
 - a. A wave means attention.
 - b. Contents of the stream.
 5. Three modes of activity: knowing, feeling and willing.
- II. Attention.
 1. Nature.
 2. Always present in some form or other.
 3. Effects: increase of efficiency.
 4. Types of inattention; how remedied.
 5. How secured:
 - a. Involuntary.
 - b. Nonvoluntary. Interest and nonvoluntary attention.
 - c. Voluntary. Will and voluntary attention.
 6. The habit of attention.
- III. The brain and nervous system.
 1. The machine through which the mind works.
 2. Structure.
 3. Central nervous system—brain and cord.
 4. Peripheral nervous system—end organs.
 5. Sensory and motor functions.
 6. Dependence of the mind on the senses for its material.
- IV. Sensory and motor training.
 1. Education dependent on both body and mind.
 2. Efficiency of nervous system depends on development and nutrition.
 3. Development though varied stimuli and untrammelled response.
 4. The sensory-motor arc.
 5. Good nutrition versus malnutrition.
 6. Necessity for sleep and freedom from worry and over-fatigue.
- V. Habit.
 1. A man is but a bundle of habits.
 2. Habit-formation a method of economy.
 3. One can not prevent habits from forming.
 4. Physical basis of habit.
 5. Control of habits through our actions.
 6. The part of habit in education.
 7. Value and danger of even good habits.
 8. Maxims for habit-forming.

- VI. Sensation and perception.
 1. Mind constructs its world from sense stimuli.
 2. How thought reaches still farther.
 3. Qualities usually ascribed to objects really existent in mind.
 4. Problem confronting the child; how he proceeds.
 5. Perception of objects and of space.
 6. Necessity of entering largely into world of material environment.
- VII. Mental imagery.
 1. All present thinking dependent on past experience.
 2. Past experience conserved by physical habit of mental images.
 3. Galton's test of imagery.
 4. Value of wide range of imagery.
 5. Application to education; use in school subjects.
- VIII. Memory.
 1. Nature of memory.
 - a. Physical basis.
 - b. Retention and recall dependent on neural plasticity and activity.
 - c. Images the material of memory.
 2. Types of memory.
 3. Laws of memory.
 4. What constitutes a good memory.
 5. Improvement of the memory.
 6. The misuse of mnemonic devices.
- IX. Imagination.
 1. Test of a good imagination.
 2. Uses of imagination.
 3. Application in science, art, every-day life, conduct, ideas.
 4. Imagination limited by—
 - a. Material available in form of images.
 - b. Constructive ability.
 - c. Definite purpose.
 5. Cultivation and abuse of imagination.
- X. Thinking.
 1. Function of thinking is to discover relations.
 2. The thinking of child and of adult.
 3. Classification of knowledge accomplished through thinking.
 4. Nature, formation and uses of concepts.
 5. Judgment and reasoning, forms and uses.
 6. Cultivation of thinking.
- XI. Instinct.
 1. Instinct the result of race experience.
 2. Through instinct racial habits are inherited by individual.
 3. Modified through education and made into individual habits.
 4. Ripening and transitoriness of instincts.
 5. Human instincts of imitation, fear and play.
- XII. Feeling and its function.
 1. An accompaniment of all mental processes.
 2. Importance as a motive.
 3. Feeling tone, or mood; how produced, and influence.
 4. How our dispositions are formed; part played by temperament.
- XIII. Interest.
 1. A selective agency among our activities.
 2. Influence in directing stream of thought.
 3. Objective side of interest.
 4. Dynamic phase of interest.
 5. Immediate and remote interests; part they play as motives.

XIII. Interest—*continued*.

6. Danger of early specialization in our interests.
7. Interest and the will.
8. Interest and character.

XIV. The emotions.

1. Relation of instinct and emotion.
2. The physical side of emotion.
3. Control of emotions.
4. Desirable emotional balance.
5. Emotions as motives.
6. Danger from arousing emotions without giving opportunity for expression.
7. Emotional habits.

XV. The will.

1. Concerns itself wholly with causing or inhibiting acts.
2. Various types of action.
 - a. Physiological reflexes.
 - b. Instinctive acts.
 - c. Ideo-motor acts.
 - d. Deliberative acts.
3. The image and the act.
4. Process of deliberation.
5. Emotional factor in decision.
6. Final test of power measured in attention.
7. Training of the will in common duties of life.

XVI. Self-expression and development.

1. Interrelation of impression and expression.
2. Many sources of impressions.
3. Various forms of expression.
4. Necessity for cultivating expression.
 - a. Intellectual value of expression.
 - b. Moral value.
 - c. Religious value.
 - d. Social value.
 - e. Educational value.
5. Expression in the home and school.
6. Expression as related to character.

REFERENCES.

References on many of the topics outlined will be found in the following: Thorndike's *Elements of Psychology*, A. G. Seiler Co., New York; Angell's *Psychology*, Henry Holt, New York; James' *Talks to Teachers*, Henry Holt, New York; Miler's *Psychology of Thinking*, Macmillan Company, New York; the files and current numbers of the *Journal of Educational Psychology*, Warwick & York, Baltimore; S. S. Colvin's pamphlet, volume VII, No. 7, 1909, of the University of Illinois, "Some Facts in Partial Justification of the So-called Dogma of Formal Discipline"; Rowe's *Habit-Formation and the Science of Teaching*, Longman's; Swift's *Mind in the Making*, Scribner's; Thorndike's *Individuality*, Houghton, Mifflin & Co.; Huey's *Psychology and Pedagogy of Teaching*; Whipple's *Questions in Psychology*, C. W. Bardeen, Syracuse, N. Y.

Experiments in *Educational Psychology*, by Daniel Starch, Macmillan Company. This little laboratory manual contains a good many simple experiments and should where possible be used in addition to a textbook for this course. Every exercise in the book will by means of experiments throw light on the actual school problem.

MUSIC.

OBJECT OF MUSIC STUDY.

The primary object of music study in the high school is something more than sight singing; and the course of study in this branch should be considered as a means of opening to the student a wider field than mere vocal or instrumental music. Rapidity of work will depend upon the ability of the pupil to read music at sight, but the end to be attained by the course should be threefold:

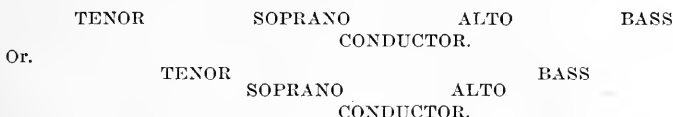
1. To stimulate an intelligent appreciation of good music.
2. To give a critical understanding of the aims and principles of the artist.
3. To inculcate an idea of the meaning of *style* in music.

Outline for Study.

I. REQUIRED OF ALL (except monotones).

1. *General Chorus Singing.* (One or two periods a week.)

To insure successful chorus work the voices should be heard separately and classified according to quality rather than range. It is injurious to sing beyond the natural range of the voice, even when it is possible to do so without immediate ill effects. The position of parts and conductor should be according to the following diagram:



Insist upon close attention of the pupil to the conductor's beat, which must be correct and decided, as only by this means may be attained the precision of attack and the shading necessary to style and interpretation.

Many of the broader principles of voice culture may be imparted to a chorus, with the effect of gaining ease of execution and improvement of tone quality. The position of mouth and body is of first importance, and is as follows: Chest naturally high, not forced up into rigidity; body erect and, in standing, the weight on the balls of the feet; head up, and music held at such an angle that the chin will not be depressed; the mouth freely open, with good space between the upper and lower teeth; lower jaw relaxed, as tension of the lower facial muscles is the chief cause of bad vocal habits and poor tone production; the expression of the face should be bright, and distortions of mouth, forehead and eyebrows should be guarded against.

The importance of consonants in singing is not always realized. In general, we sing tones on vowels alone, but perfect diction depends also upon consonants, which should be pronounced clearly and with slight exaggeration.

Good collections of songs for this course will be found in the following books: Laurel Reader; Laurel Song Book; Assembly Hymn and Song Collection, Hoover; Beacon Song Collection No. 2; Student's Hymnal, Noss.

II. ELECTIVE.

1. *Glee Club or Orchestra.*

Students of musical ability may be admitted to these organizations on the recommendation of the instructor. The work should consist of regular practice periods under a competent leader; and it is recommended that credit on a period basis be allowed for this work as for any elective course.

Required that students entering glee club or orchestra take the course in Musical Appreciation.

2. *Theoretical Music.* (Two periods.)

The object of this course is to develop sensitiveness to rhythm, melody and harmony; and to develop a sound taste for music through an understanding of its technical elements, rather than by specialized training in composition.

a. Notation. The student should be familiar, by drill and review, with note and rest values, clefs, key signatures in major and minor, meter signatures, dotted notes, group notes (doublets or triplets), and with the following symbols of interpretation: hold, tie, slur, legato, staccato, crescendo, diminuendo.

b. Scales (major, minor, and chromatic).

c. Intervals (recognized and named).

d. Ear training.

e. Dictation.

3. *Musical Appreciation.* (Three periods.)

a. Analysis of musical forms. A study of the historical development of the folk song, harmonic music, canon, fugue, suite, sonata, symphony, opera, oratorio, cantata, and song cycle.

b. The lives of the following should be studied with a view to representing the composer in terms of his time: Bach, Handel, Haydn, Mozart, Beethoven, Spohr, Weber, Rossini, Schubert, Schumann, Donizetti, Chopin, Mendelssohn, Liszt, Verdi, Wagner, Rubinstein, Brahms, Saint-Saëns, Grieg, and MacDowell. The themes of the best works of the above musicians should be studied, and illustrations of various compositions may be given by piano, voice or victrola, so that familiar names may be associated with these productions. The works may also be interpreted in terms of the personality of the composer.

c. Appreciation and understanding of the make-up of an orchestra, with the development of instruments to suit the growing needs of the compositions.

4. *Private Lessons.*

It is recommended that music lessons, taken privately under a teacher of recognized standing, be offered for credit, at the discretion of the school instructor in music or the principal. A report as to application and progress in the private work should be added to the regular high-school report.

DRAWING AND DESIGN.

Drawing in the high school should first of all advance an interest in all lines of art expression. The pupils' own attempts in the right direction should teach them to appreciate the sincere efforts of our own modern painters, sculptors and illustrators. Every child loves pictures. It is just as necessary that they should learn to judge between the good and the bad in art as in literature. A pupil who gains the ability while in school to enjoy the best in literature and the best in art is made capable of a rich mental life.

However, it is not pictures or what is termed fine art alone that should be studied. There are more ordinary things: book and magazine illustrations, rugs, draperies, wall paper, pottery, china, the simplest textiles that we wear, and everything that we surround ourselves with, may be, and certainly ought to be, art expressions. The study of design as applied to these things develops an understanding of color and a sincere love for the simple and harmonious which is the highest ideal of good taste. There are great possibilities for capable designers in all these fields of work. Then, from a trade standpoint, as well as from a culture standpoint, drawing and design are well worthy of a place in the curriculum of every high school.

TERM I.

SKETCH.—Line, Pencil, Charcoal.

Four weeks of five forty-minute periods.

Pose some pupil of the class, standing back view. Proportion is the first thing to be secured. Pay no attention to detail until the pupils have gained a thorough knowledge of elementary proportions. Look for the line of balance in a figure standing first on one foot then on the other. When approached from the standpoint of elementary principles of proportion and action, this work is preparation for all kinds of illustration.

COLOR THEORY.

(Ross' three-color theory.)

Five or six weeks.

Keep notes and make chart. Learn to know color. Be able to mix and make good washes of the standard colors. Primary colors are red, yellow, and blue. Binary colors are orange, green, and violet. Show how these colors can be neutralized by mixing them with their complements, red-green, yellow-violet, orange-blue. Make the half neutrals of each of the standard colors.

Study the color harmonies: one mode, analogous, and complementary. Try to get the students to feel a personality in each of the colors. Get many samples of cloth and wall paper to represent the colors in a definite way.

SKETCH.—Line and Shade.

Three or four weeks.

Sketch work is a matter of gradual development. Artists spend years at it, and yet the subject is never exhausted. Try a sitting pose and begin to look for light and shade.

DESIGN OR THE PRINCIPLES OF ORDER.

Five or six weeks.

I. Greek rule of proportion. Study good relation of areas:

1. Border to background space.
2. Margin to be left around a page of writing.
3. Mounting of pictures.
4. Frames for pictures.

II. Teach the meaning of rhythm and balance of line and area. Illustrate with small border design cut from the School Arts Book or the Craftsman.

III. Explain the meaning of motif. (Batchelder's first and second books on design will be great helps to the teacher; also, Prang's Art Education for High Schools.)

IV. Develop a border motif and corner motif, either entirely abstract or conventional, using quadrangle paper.

Discuss the application of straight-line and curved-line designs to different textiles. Let the pupils stencil their design on suitable material, making some useful household article, such as cushion cover, table runner, dresser scarf, bags of various kinds, and curtains.

Judge a design always from the standpoint, first, of use; second, of fitness to material; third, of beauty and harmony.

Girls take a keen interest in all forms of applied textile design; boys do not. Therefore it is suggested that for applied work for boys leather work and art lettering be substituted. Brown's book on Letters and Lettering is very good. The same principles apply to the placing of printing and decoration on posters and book covers as are given in beginning design.

At the end of the first term each pupil should have four or five approved sketches, color chart, notebook, and one or more applied designs.

TERM II.

SKETCH.—Pencil or Charcoal.

Try some difficult poses and begin to work earnestly for good light and shade effects and expression in the pose of the figure. Do not pay much attention to detail; look only for simple masses of light and dark.

FREE-HAND PERSPECTIVE.

Four of five weeks.

This is very important work. Teachers will find a very clear statement of principles in Prang's Art Education for High Schools. Require pupils to keep careful notes of the principles in parallel and angular perspective, illustrating by small sketches in notebooks. Practice drawing all kinds of objects, chairs, tables, etc., first in parallel, then in angular perspective. Do considerable work from memory from certain well-known buildings and streets in town. Too much emphasis can not be put upon this work. Pupils take more interest in it than would be expected at first. Perspective can be made an interesting subject. Keep referring to these principles during all the sketch work.

HISTORY OF ART.—Picture study.

During the time given to sketching and perspective drawing it would be interesting to study the work of some of the modern and some of the ancient artists.

Teachers can obtain penny pictures from the Perry Picture Company, Malden, Mass., for as many of the students as care to get them. The following artists are among those with whom the pupils should become acquainted:

Old Masters: Michael Angelo, Leonardo di Vinci, Raphael, Holbein, Rembrandt, Franz Hals, Millet, Fra Angelico, Titian, Tintoretto, Giorgione, Botticelli, Rubens, Van Dyck, Andrea del Sarto, Bellini, Carpaccio, Velasquez Murillo, Guido Reni, Dürer.

Modern: Whistler, Sargent, Abbey, Sir J. Reynolds, Constable, J. M. W. Turner, Elihu Vedder, Wm. M. Hunt. Information concerning many others may be obtained through the International Studio.

It is a good plan to take up the artists' life and show, if possible, how his life and surroundings affected his work and what he stood for in art.

DESIGN.

The pupils ought to be gaining an interest in the different magazine illustrations and various textiles. It is good to have them collect everything that pleases them and anything that suggests a design. Let them design a cover for an art notebook. Make the cover of some tough cardboard and let the pupils carry out their designs in water color. Type-writing paper makes very nice leaves for the inside. Sew them to the cover with linen thread.

STILL LIFE.

Use some old brass or pewter articles, with old china or pottery. Use simple neutral backgrounds and try to get good composition and light and shade. The principles of design are the principles of composition. If the teacher finds conditions unfavorable to sketch work, still life might be substituted for some of the sketch work.

TERM III.

At this time in the course each pupil should know what line of work he is best fitted for. Boys usually do better in sketch, illustrating, book-cover, and poster work. It is profitable for the boys to work on the dif-

ferent illustrations and designs for the school publication and also to make posters for all school events.

INTERIOR DECORATIONS.

This work is very important, and each teacher will find that it is alike interesting to teacher, boys, and girls.

Any problem in design should begin with a clear statement of principles involved. A careful review of color schemes, principles of design and perspective is necessary before taking up interior decoration.

I. Advanced perspective. Some mechanical work is necessary before the students will be able to construct their own rooms. The teacher will find it a great help to have the pupils provide themselves with illustrations from various magazines and study these in order to know about some of the woodwork construction, window frames, baseboards, and door frames.

1. Decide on the use of the room.

2. Carefully consider the light, decide on the color scheme. Teach the relation in tone and value of the ceiling to side walls and to floor covering. After the pupils have decided on all these things and mixed their water color for each, they may put on smooth washes in the spaces for ceiling, side walls and floor. Whatever furniture is to be in the room should, of course, be drawn in correct perspective before any color is put on. Furniture, draperies and bric-a-brac should be the last things to be painted. Teach pupils that these are not the first things to be thought of in furnishing a room.

This work will probably take ten or eleven weeks. It is too long a problem to be continued without interruption. After the pupils have made preliminary sketches for the room, it would be a good plan to take up sketch or still-life work.

SKETCH.—Charcoal, Ink or Pencil.

Try more difficult poses and more complicated light and shade. At this time pupils might attempt to work out the face in simple masses of light and shade.

DESIGN.

At this point pupils begin to understand what kind of a design may properly be applied to different materials—silk and linen, and heavy material, leather and clay. Let them make designs for small card cases and coin purses in leather, tooling and sewing the cases.

TERM IV.

DESIGN.

Cover designs for the school paper and headings for the different departments of the paper. Study the work of poster makers to be found in illustrated weeklies and magazines, also in the art publications above mentioned. Make an original poster announcing some local school event.

SKETCH.

Continue working for effective poses, good proportion, and effective light-and-shade work. Get some thought of good composition by placing the figure well on the paper, so that there are agreeable background spaces left.

DESIGN.—Bookbinding.

This last problem of the course should be a practical combination of all the art knowledge and skill previously gained. It is possible to have paper cut and to bind a blank book for a diary, scrapbook, kodak book, or for some other purpose. The pupils might bind some old book in either linen or leather (sheepskin), making a suitable design and applying it to

the cover either by stenciling or tooling. Let each one design a title page and book plate.

The success or failure of art instruction is dependent, more than any other kind of teaching, upon the personality and resourcefulness of the teacher. Because art is personal and individual, each pupil must be approached in a different way. Whether conscious or not of having any art feeling, people are constantly expressing themselves in what ought to be terms of beauty. It is the business of a public-school art teacher to rouse the pupils to a consciousness of the universal desire for the beautiful and to give them an intelligent method of satisfying it. An earnest, sincere teacher will often find her own resources fall short of the needs and must turn to fellow laborers for mental stimulus.

BOOKS.

The following books and periodicals are recommended for the inspiration of teachers, but not for copy work in the schoolroom, for that is destructive of all original thought:

The School Arts Book, Davis Press, Worcester, Mass.; Craftsman, The Craftsman Publishing Company, 41 West Thirty-fourth street, New York; Arts and Decoration, Adam Budge, 16 East Forty-second street, New York; International Studio, John Lane Company, 110-114 West Thirty-second street, New York; Batchelder's Books on Design, The Inland Printing Company, Chicago; Prang's Art Education for High Schools, The Prang Educational Company, Chicago; Masters in Art (for history of art), Bates & Guild Company.

MECHANICAL DRAWING.

Mechanical drawing should be a part of every boy's education, since it plays an important part in almost every line of life's work. It is one of the most practical and interesting subjects in the course of study. There is nothing made without a drawing first; it may only be on the mind's drawing board, or it may be on paper. Mechanical drawing is the means of transferring an idea from the mind of one person to another through the medium of lines. It is the language by which the designer, the architect and the engineer speak to the workman. A well-made drawing will very often save hours of verbal or written explanations and will be a great deal clearer. It teaches one, first, to be accurate and neat; second, to see things as they really are; and third, to think and express ideas so that others may see them and thereby be able to execute them.

Mechanical drawing is as essential to the farmer and the professional man as to the mechanic. The surgeon who has studied drawing has learned some of the essential parts of his profession: cleanliness, neatness, and most important of all, accuracy; he has been taught to see things as they really are, and is thereby better enabled to do his work. Nearly every man that holds a public office, whether it be in some school district or township or in the state legislature, is called upon time and again to pass on plans of bridges, roads, schoolhouses, and public buildings of various kinds. How convenient it would be about the farm if every farmer used the principles of mechanical drawing in the designing of his house and in placing his barns, sheds, outhouses, pens, etc.

It is needless to say that knowledge of mechanical drawing is an essential qualification in most lines of engineering. Mechanical drawing may be considered a universal language of lines instead of letters, the same methods of representing objects being used by men of all nationalities, the only differences being in the notes, units of measurement, and written instructions appearing on the face of the drawing in the language of the country in which it is made.

Drawings are first made in pencil. They may be made to any con-

venient scale, as, full size, half size, quarter size, etc. If a number of the same drawings are wanted, a tracing is made on transparent paper or cloth, and from the tracing any number of blueprints may be made.

BLUEPRINTING.

Blueprinting is a process of reproducing copies of a drawing from a tracing on chemically coated paper, known as blueprint paper. The tracing in blueprinting acts as a negative does in photography. The tracing is put in a printing frame with a piece of blueprint paper behind it, and is placed in the sun. The sunlight is allowed to penetrate the tracing for a few minutes, so as to act on the sensitive chemicals. The paper is then washed, and the coated surface becomes a deep blue, except where it was covered by the black lines on the tracing. The lines that were black on the tracing will appear white on the blueprint.

EQUIPMENT.

The equipment of the drawing room should receive careful consideration. The kind of work obtained depends largely on the quality of the instruments and the material used. It does not pay to buy a cheap grade of instruments. A good set well cared for will last a lifetime. Each student should be furnished with the following tools and supplies:

1 set of instruments.	1 dozen thumb tacks.
1 T square.	1 3H drawing pencil.
1 45 triangle.	1 6H drawing pencil.
1 30 triangle.	1 drawing board.
1 French curve.	1 writing pen and holder.
1 12" U. S. standard scale.	1 bottle black W. P. drawing ink.
1 pencil eraser.	Drawing paper.
1 ink eraser.	

This outfit may be obtained from local dealers or from any of the following: Keuffel & Esser Co., St. Louis, Mo.; Eugene Dietzgen Co., Chicago, Ill.; F. D. Fink Co., St. Louis, Mo.; Frederick Post Co., Chicago, Ill.

Course of Study.

The following course is designed so that it will enable the student to acquire, first, the ability to letter; second, proficiency in the use of instruments; third, knowledge of conventions and methods in drafting-room practice; fourth, acquaintance with elementary geometric constructions; fifth, an understanding of orthographic and isometric projections, intersections and developments; and sixth, the ability to make and read working drawings and blueprints.

Plate I.—Letters. Placing, form, slant and inking of a simple free-hand, single-stroke letter.

Good lettering and printed notes are as essential to the making of a good drawing as are well-made lines. For that reason a good deal of attention should be given to the making of correct letters. A good drawing with poor lettering is almost worthless, while good lettering will improve any drawing.

Every drawing should be made neat and accurate and always be free from finger marks. A pencil drawing when finished should look as well as an inked drawing; therefore, avoid unnecessary lines, and draw line or letter but once. If a drawing is made to scale, it is very important that the drawing be accurate, as a slight variation in a line might mean inches, and even feet, in the finished structure. To do neat and accurate work, keep the pencils sharp.

Lecture on the use of the instruments and materials, including the use of each tool in the drawing outfit.

Plate II.—Lines. Different lines used in drawing are as follows:

- Border line is a fairly heavy full line.
- Outline is a medium full line.
- Center line is a very light dot-and-dash line.
- Dimension line is a very light dash-and-two-dot line, with arrow heads at the extremities.
- Hidden line is a very light dotted line.
- Projection line is a very light dash line.

Lecture on the use of the ruling pen, compass pen, and inking straight and curved lines.

The ruling pen is used for inking straight lines. It should be filled with a quill or common writing pen. Never dip it into the ink and never allow ink to be on the outside of the blades when in use. About one-fourth inch of ink should be put into the pen at a time. The width of the line to be drawn is regulated by the thumbscrew. In drawing lines the pen is inclined a little in the direction in which the lines are to be drawn. When the T square or triangle is used as a guide, the points of the pen should not touch the lower edge. Always have the thumbscrew away from the guide.

The compass pen is used for inking circles. The two legs of the compass should always be parallel. Ink all curved lines first. Join straight lines to curves, never curved lines to straight lines.

Carefully wipe out the pens with chamois or a soft cloth after using, as the ink may cause the steel to corrode.

GEOMETRIC PROBLEMS.

A few plates should be drawn to acquaint the student with the proportion, construction and measurements of geometric figures, for these are the bases of all principles involving the art of mechanical drawing.

Plate III.—Geometric Problems.

- To bisect a line.
- To draw a perpendicular at the end of a given line.
- To draw a perpendicular from a point to a line.
- To divide a line in five equal parts.

Plate IV.—Geometric Problems.

- To bisect an angle.
- To construct an angle equal to a given angle.
- To construct a triangle when three sides are given.
- To construct a triangle when two sides and the included angle are given.

Plate V.—Geometric Problems.

- To describe an arc or circumference through three given points not in the same straight line.
- To inscribe a regular pentagon in a circle.
- To draw a line tangent to a circle at a given point on the circumference.
- To draw an ellipse when the two axes are given.

PROJECTIONS.

Principles of projections.

Plate VI.—Orthographic Projections.

- Given top and front of square prism. To obtain side view.
- Given top and side view of rectangular pyramid. To obtain front view.
- Given top view of regular hexagonal prism. To obtain front and side view.
- Given front and side views of triangular pyramid. To obtain top view.

Plate VII.—Orthographic Projections.

Given front view of a square prism resting on one edge. To obtain top and side views.

Given side view of triangular pyramid with apex off center. To obtain top and front view.

Given top and front views of a wedge resting on one corner. To obtain top view.

Given front view of hexagonal pyramid resting on one edge at an angle of 30 degrees. To obtain top and side views.

SCALE DRAWINGS.

Lecture on the use of the scale and the importance of accuracy in scale drawings.

Plate VIII.—Working Drawing. Three views of a simple rectangular block, with dimensions. Drawings to be made from the block. Scale full size.

Plate IX.—Working Drawing. Three views of a rectangular block cut by different planes, with dimensions. Drawings to be held from the block, to scale.

Plate X.—Working Drawing. Two or three views of a footstool, taboret or mantle, with all dimensions, details of joints, drawers, etc. Drawings to be made from perspective drawings, to scale.

Plate XI.—Assembly Drawing. Assembly drawing to scale of some piece of furniture, such as chair, desk, or bookcase, with bill of stock. The student should design some piece of furniture from pictures, drawings, cuts, and suggestions made by the teacher or from his own ideas.

Plate XII.—Detail Drawing. Two or more views of each part of the project designed in plate XI, with dimensions, to scale.

Plate XIII.—Isometric Projections. Make an isometric projection of a cube, a hexagon, an instrumental circle, and a free-hand circle.

Plate XIV.—Isometric Projections. Make an isometric projection of a stand, table, hexagonal nut, face plate, or something of that kind.

Plate XV.—Intersections of Solids. Prism cut by a cone; cylinder cut by a cone, etc.

Plate XVI.—Development of Surfaces. Development of pipes, elbows, tinware, etc.

Plate XVII.—Helix, with its Application. Principle of the helix; helix as applied to V threads, square threads, round and square wire springs.

Plate XVIII.—Conventional Forms of Threads. Threaded bolts, set screws, pipes, etc.

Plate XIX.—Working Drawings. Two or more views of different machines with sections from free-hand sketches and castings, such as bearings, hand wheels, shaft hangers, etc., to scale.

Plate XX.—Tracings and Blueprints. The student should make a tracing and a blueprint of at least one of his plates.

The above course is designed to cover one forty-minute period every day or one double forty-minute period every other day for one school year of thirty-six weeks. If more than one year of drawing is to be given, the above course may be followed by machine drawing and design and simple architectural drawings.

DOMESTIC SCIENCE.

Three-fifths unit or one unit.

NOTE.—The courses in domestic science and domestic art have been arranged so that both together may constitute a single unit of credit in the proportion of three-fifths and two-fifths, respectively; additional work is also described in each branch, so as to provide for a full unit of credit in each.

The growing realization of the importance of and the interest in the study of home economics in the state has made it necessary, in so far as is possible, to establish a standard course of study. In the absence of a satisfactory text in either domestic science or domestic art, the following syllabus, with suggestive details and bibliography, insures a similarity of subject material but does not limit the individuality of the teacher.

OBJECT OF THE COURSE.

The purpose of a course in domestic science is twofold. It has both a social and an educational aspect. From a social point of view, it dignifies manual labor, it brings the school into closer relations with the home and the community, with an uplifting influence on both, and teaches that home making is a profession requiring training just as truly as does that of the doctor or the lawyer; educationally, it correlates with all other school work to so great a degree as to furnish application for much in education that may otherwise appear formal, it trains the head to purposeful thinking, and teaches the hand to obey the thought to its own greatest efficiency. Specifically, it teaches that there is a right way of preparing food so that it may serve its purpose of nourishment economically; that there is a labor saving and a labor making way of performing the household tasks; and that work well and skillfully done is not drudgery but an interest-absorbing occupation.

TIME.

The time given to the work should be three periods per week if domestic science is to be a part of the unit credit with domestic art, or should be five periods per week if it is to constitute a unit in itself. These periods must be double periods if used for laboratory work, but should be single periods if used for lecture and recitation. For the three-fifths unit, one single period for theory and two double periods for practice is suggested, and for the five-fifths unit, two single periods for theory with three double periods for practice.

PREVIOUS TRAINING.

This course is planned for those who have had no previous school training in domestic science.

EQUIPMENT.

A. LEAST POSSIBLE FOR SATISFACTORY WORK FOR CLASS OF 12.

One gas, coal or gasoline range with oven, laboratory tables to supply each student with at least 30 inches working space and one drawer for individual equipment.
Twelve gas plates.

NOTE.—For further discussion of stoves and fuel, see suggestions at end of this list.

One supply table.
One cupboard.
One teacher's desk and chair.
Six stationary towel racks or one large clothes horse.
Twelve stools.

NOTE.—A small seat may be made to draw out from table instead of using stool. (See page 23, "Outline Lessons in Housekeeping," Office of Indian Affairs, Government Printing Office, Washington, D. C., for diagram of table to which draw seat could be added.)

One refrigerator or ice box.

Twelve standard bread tins $4\frac{1}{2} \times 4\frac{1}{2} \times 9$.

NOTE.—Instead of the standard bread tins for two girls, individual bread tins $2 \times 3 \times 6$ can be made by the local hardware store, and sold at not to exceed 10 cents each. These prove very satisfactory.

One large supply canister, size to hold 50 pounds of flour.

Two 2-quart supply canisters.

Four 1-quart supply canisters.

Ten jelly glasses with lids.

One potato ricer.

One frying basket.

One frying kettle.

Six four-hole muffin pans.

Three rolling-pins.

NOTE.—Small rolling-pins are very satisfactory. These can be made by boys in manual-training work. They are not likely to be needed before the middle of the first term, hence ample time for the boys to make them.

One toaster.

Three cake tins for loaf cake.

Three wire cake coolers.

One medium-sized meat grinder.

One 2-quart coffeepot.

One 1-quart teapot.

NOTE.—Three one-quart coffee and tea pots are really much more satisfactory, i. e., a one-quart pot of each for four girls.

One large steel skillet.

One 1-quart bean pot.

One roaster with cover.

Two teakettles.

Two chemical thermometers, one Fahrenheit and one Centigrade.

One bread knife.

One butcher knife.

One can opener.

One corkscrew.

One ice pick.

One knife sharpener.

One trussing needle.

One large milk pitcher.

One pair scissors.

One quart measure.

One dustpan.

One broom.

One stove brush.

One garbage bucket.

One clock.

Five dozen tea towels. (May be furnished by student if necessary.)

Two $\frac{1}{2}$ -dozen dishcloths. (May be furnished by student if necessary.)

Twelve vegetable knives.

Twelve case knives.

Twelve forks.

Twelve tablespoons, silver or metal.

Twenty-four teaspoons, silver or metal.

Twelve crockery bowls, 1 quart.

Twelve glass measuring cups—standard, $\frac{1}{2}$ pint.

Twelve desk plates.

Twelve crockery ramekins.

Twelve tin pie pans ($4\frac{1}{2}$ inches).

Twelve dish pans.
 Twelve small saucepans with handle.
 Twelve small steel skillets, omelet pans.
 Six small wire sieves.
 Two glass lemon squeezers.
 Six egg beaters—small size, *i. e.*, for one egg.
 Six kettles.
 Six double boilers or improvised double cookers, with saucepan and kettle.
 Six soap dishes.
 Six scrubbing brushes.

STOVES AND FUEL.

In many towns the use of gas plates is impossible, but *some* form of individual stove *should* be supplied. There are a number of possibilities:

1. Coal-oil stoves.—Somewhat dirty, and therefore rather unsatisfactory.
2. Gasoline stoves.—Less dirty, too dangerous.
3. Electric plates.—Most ideal, very expensive.
4. Gas plates.—Furnished with gas from gasoline retained in outside tank or cistern. Safe.
5. Alcohol stoves.—For burning denatured alcohol. (Caution should be made emphatic that under no circumstances should use of wood alcohol be permitted for burning in these stoves. Wood alcohol burns to formaldehyde and water. Formaldehyde fumes have a paralyzing effect upon muscles of eyes and throat, and wood alcohol is hence injurious to burn for light or fuel. Denatured alcohol is common ethyl or "spirit" alcohol plus a minimum quantity of poison, which renders it undrinkable. This when burned simply oxidizes to carbon dioxide and water.)

The alcohol stove seems to be most satisfactory of all. For list of varieties of these stoves address:

Orr & Lockett, hardware dealers, 71-73 Randolph St., Chicago, Ill. (Also list of domestic-science equipment and table tops.)

E. H. Sheldon & Co., 320-328 N. May St., Chicago, Ill. (Also for catalogue of tables for domestic science kitchens and varieties of table tops.)

M. & D. Range Co., 96-100 Lake St., Chicago, Ill. (Also for all hardware equipment for domestic-science departments.)

The Bangs Hardware Co., Chicago, Ill.

Specialists in alcohol stoves:

Manning Bowman Co., Meriden, Conn. (Send for booklet.) Cost, \$4.50 for No. 60, a very ideal little stove; also sell one for \$2.50.

The Norma alcohol stove costs \$2.50. Address Walker & Co., Boston, Mass.

Lewis & Conger, New York City, sell a stove for \$2.70.

The government bulletin on "Outline Lessons in Housekeeping," sent out from Office of Indian Affairs, Government Printing Office, quotes a price on individual alcohol stoves of \$1.25 each. At that price the stoves ought to be within the reach of any school for individual equipment. Caution should be made, in the use of the alcohol stove with tank, that the tank be filled only two-thirds its capacity, to allow for expansion under conditions of increased warmth.

NOTE.—The government bulletin mentioned above also gives lists of individual and general equipments for classes in domestic science. That list is a "minimum" equipment, at fairly reasonable cost, and from it several mentioned articles might be wisely eliminated. A second bulletin put out by the government from the Office of Indian Affairs, entitled, "Some Things that a Girl Should Know How to Do, and Hence Should Learn How to Do While in School," will also be found helpful in this work.

B. ADDITIONAL DESIRABLE EQUIPMENT:

- One fireless cooker.
- Twelve small wooden spoons.
- Twelve steel spatulas (6-inch).
- Twelve square cake tins ($1\frac{1}{4} \times 1\frac{1}{4} \times 4\frac{1}{2}$).
- Twelve egg whisks.
- Ten safety match-holders.
- Six small supply canisters or jelly glasses with lids.
- Six china plates, 8-inch.
- Six china plates, 6-inch.
- Twelve china plates, 5-inch.
- Six china cups and saucers.
- Six glass sherbet cups.
- Six water glasses.
- One glass water pitcher.
- One china creamer and sugar.
- One china vegetable dish.
- One china platter.
- One set knives and forks, silver.
- One dozen teaspoons, silver.
- Three tablespoons, silver.
- One carving set.
- One tray.
- One dining-room table.
- Six dining-room chairs.
- One silence cloth.
- Two tablecloths.
- One dozen napkins.
- One centerpiece.
- One tray cloth.

Course of Study in Foods.

Three-fifths unit.

1. LABORATORY.—Cleanliness, order and exactness of measurement should be emphasized.
 - a. Study of equipment.
 1. Structure of range and principles of fire building and management.
 2. Purpose and method of using utensils.
 3. Principles of cleaning.
 - b. Methods of working.
 1. Use of accurate measurements.
 2. Determination of tables of measurement.
 - c. Preparation and serving of the following foods in respect to (a) underlying principle of cookery, (b) ideal results, (c) manner and place of serving, with accompaniments:
 1. Water.
 - a. Sources of drinking supply.
 - b. Safe water, how procure or insure.
 - c. Water as a solvent.
 - d. Water as a carrier of flavors.
 1. Beverages—decoction, infusion.
 2. In fruits—fresh, replacement of in dried.
 3. In ices.

* For a detailed outline of single lessons, see VII and VIII. Detailed outlines of all lessons for a term's work will be found in "Principles of Elementary Cookery," which may be obtained of the State Agricultural College, Manhattan, at 25 cents each, and which should be in the hands of all pupils. Teachers also should have a copy of "Syllabus of Domestic Science and Domestic Art" for 1910-'11, published by the University of Illinois, Urbana, Ill.

1. LABORATORY—*continued.*

c. Preparation and serving of foods.

2. Fruits, fresh and dried.
3. Sugar, stages of cookery illustrated by candies.
4. Starch.
 - a. Experiments to show behavior with dry and moist heat differently applied.
 - b. Cookery in starchy vegetables and in sauces.
 - c. Combination of sauces with foods, to form variety of starchy dishes.
 - d. Principles of cookery applied to starchy desserts and beverages.
 - e. Cookery of starch in cereals as differing from freed starch.
5. Use of fats in foods.
 - a. Making of plain pastry and its use in pies.
 - b. Method of cooking in deep fat.
 - c. Method of cooking in shallow fat.
 - d. Economical use of fat, unfit for cookery, in making soap.
6. Protein.
 - a. Experiments to show behavior of protein at different temperatures, illustrated by soft- and hard-cooked eggs.
 - b. Enclosure of air in eggs by beating.
 - c. Eggs used for thickening in combinations of milk and eggs.
 - d. Combination of starchy and protein foods.
 - e. Cookery of cheese.
 - f. Structure and cuts of meat and fish as related to cookery and use as a protein food.
 - g. Cookery of vegetable protein in legumes and nuts.
7. Use of gelatine in plain jellies and sponges.
8. Study of leavening agents and flour mixtures.
 - a. Experiments to show effect of moisture and heat upon different agents.
 - b. Development of principles of use and care.
 - c. Preparation of quick breads and cakes to illustrate use of air, soda, and baking powder, and also the mixing of batters.
 - d. Making loaf of bread to illustrate leavening with yeast and the mixing of doughs.
9. Salads.
10. Frozen dishes.
11. Combination of principles learned and table setting and serving in the preparation and serving a simple meal.

2. THEORY.—To be taught by lecture and reference work and recitation.

- a. Development of primitive to modern apparatus for, and methods of, cookery.
- b. Physics of heat production.
- c. Efficiency and economy of different fuels.
- d. Sanitary and economic materials for utensils.
- e. Foods in general; definition, classification, use, methods by which they are made available.
- f. Study of the five foodstuffs as to the principles which separate them into classes.

2. THEORY.—*continued.*

- g. Foods representative of or related to the different classes studied as to (a) source, (b) composition, (c) production, (d) digestion, (e) economic and nutritive value, (f) purchasing, and (g) care.
 - 1. Water and mineral salts—ex., salt, water, tea, coffee, fruits, fresh vegetables.
 - 2. Carbohydrates—ex., sugar, starch, fruit, vegetables, cereals.
 - 3. Fats—ex., butter, cream, lard, olive oil.
 - 4. Protein—ex., eggs, milk, cheese, meats, fish, legumes, nuts, gelatine.
- h. Acids and alkalies as related to chemical leavening agents, their manufacture and adulteration.
- i. Yeast as a plant, and its relation to bread making.
- j. Conditions which make for and against the ideal loaf of bread.
- k. Physics of freezing.

ADDITIONAL WORK.

Two-fifths unit. Given to make Domestic Science one full unit.

- 1. LABORATORY—*Canning and Preserving*.—To be accompanied by lectures and recitations on preservation of food, and to occupy one-third of the additional time.
 - a. Principles of sterilization.
 - b. Cookery of fruit and vegetables in relation to preserving shape, color and flavor.
 - c. Canning.
 - d. Preserving.
 - e. Pickling.
 - f. Jelly making.
- 2. LABORATORY—*Invalid Cookery*.—To be accompanied by lectures and recitations on personal hygiene, and to occupy one-third of additional time.
 - a. Rules for administration of foods to invalids.
 - b. Preparation of liquid foods; drinks, broths.
 - c. Preparation of easily digested, nourishing solids.
 - d. Preparation of trays for special cases.
- 3. LABORATORY—*Advanced Cookery*.—To be accompanied by lectures and recitations on the home, and to occupy one-third of additional time.
 - a. More complex dishes representative of the different classes of foods not included in foods course but dependent upon them for foundation principles.
 - b. Serving of meals to give practice in marketing and serving.
- 4. THEORY—*Preservation of Food*.
 - a. Conditions favorable and unfavorable to the growth of—
 - 1. Yeast.
 - 2. Mold.
 - 3. Bacteria.
 - b. Means of destroying microörganisms.
 - c. Relation of microörganisms to preservation of food.
 - d. Methods of food preservation.
- 5. THEORY—*Personal Hygiene*.
 - a. Health—definition, value of, personal responsibility for, factors in.
 - b. Hygiene of—
 - 1. Bathing.
 - 2. Clothing.
 - 3. Feeding.
 - 4. Sleeping.
 - 5. Exercise.

5. THEORY—*Personal Hygiene.—continued.*

c. Special care of—

1. Eyes.
2. Ears.
3. Nose.
4. Throat.
5. Mouth.

d. Bandaging and care of wounds.

6. THEORY—*The Home.*

- a. Location of house in regard to drainage, sunlight, prevailing wind, neighborhood.
- b. Considerations to be observed in planning a house.
- c. Heating, lighting and ventilation, principles of each and relations to each other.
- d. Convenient, abundant and pure water supply.
- e. Disposal of sewage and garbage.
- f. Care of the home.
- g. Division and expenditure of income.

SUGGESTED DETAILED OUTLINE.

FOR LABORATORY LESSONS TO ILLUSTRATE EGGS USED FOR THICKENING IN COMBINATIONS OF MILK AND EGGS.

1. CUSTARDS.

- a. Principles.—That of the cookery of albumin. Preferred temperature 160° F. to 180° F. A custard is a mixture of egg and milk, sweetened and flavored.
- b. Methods of cooking.
 1. Soft custard.
 2. Steamed custard.
 3. Baked custard.
 4. Fried custard.
 5. Frozen custard.
- c. Utensils.
 1. For soft custard, double boiler.
 2. For baked custard, set of cups or molds in a pan of water.
 3. For steamed custard, cups or molds, covered, set in steamer.
- d. General rule or formula for a simple soft custard.
 1. Ingredients: 1 c. milk; 1 egg; 2 tbsp. sugar; ½ tsp. flavoring.
 2. Method of combining:
 - a. Heat milk in double boiler.
 - b. Beat egg slightly.
 - c. Pour carefully the hot milk over the other ingredients beaten together.
 3. Precautions:
 - a. If cooked too long it curdles.
 - b. Stir to keep smooth and avoid lumping.
 - c. Do not mix much sugar with little egg as it makes yellow threads through liquid.
 - d. Do not beat the eggs too light.
 - e. Pour the milk over the egg to avoid lumping and to rinse out the bowl.
- e. Tests when done.
 1. For soft custard.
 - a. Heaps on spoon.
 - b. Foam disappears.
 - c. Coats the spoon.
 - d. Thickens.

1. CUSTARDS.—*continued.*

- e. Tests when done.
 - 2. For baked custard.
 - a. Knife blade comes out clean.
 - b. Puffs on top.
- f. Substitutes for eggs, or how fewer could be used.
 - 1. Cornstarch or flour with egg, as in puddings or sauces.
 - 2. Gelatine with eggs, as in creams or Bavarians.
- g. Kinds.
 - 1. Caramel custard.
 - 2. Tapioca.
 - 3. Chocolate, cocoanut, etc., named from various flavors.
- h. Serving.
 - 1. Soft custard.
 - a. By itself.
 - b. As a sauce for puddings.
 - c. As a part of dishes like floating island.
 - d. With meringue and jelly.
 - e. Poured over fruit or cake.
- i. Suggestions.
 - 1. If curdled, beat with egg-beater, or pour back and forth, using two dishes.
 - 2. Remove from double boiler as soon as cooked to prevent overcooking.
 - 3. When cooling stir occasionally to prevent coating forming.
 - 4. More mellow if flavored when hot, but more flavoring required.
 - 5. When used as a sauce, have custard thin enough to pour.
 - 6. For a thicker custard, increase the number of eggs; one egg thickens as much as one tablespoonful of cornstarch.
 - 7. Usually allow 2 tablespoonfuls of sugar to each egg.
 - 8. Yolks alone make a smoother custard, two yolks substituting for one egg.
 - 9. Two whites in place of one egg make a white custard.

SUGGESTED DETAILED OUTLINE.

FOR THEORY LESSON ON EGGS.

1. EGGS.

- a. Kinds.
 - Hen, duck, goose, turkey, guinea hen, prairie chicken, plover, seagulls, ostrich, turtle, fish.
- b. General structure.
 - 1. Shell—porous.
 - 2. Lining—a tough, white membrane.
 - 3. White—a solution of proteids enclosed in thin-walled cells.
 - 4. Yolk—an emulsion of fat in proteid solution.
 - 5. Nucleus—a starting-point of development of young chick.
 - 6. Cords—composed of albumen, suspending yolk in white.
- c. General composition.
 - 1. Water, 73.7 per cent.
 - 2. Proteid, 14.8 per cent.
 - 3. Fat, 10.5 per cent.
 - 4. Mineral matter, 1.0 per cent.

1. EGGS.—*continued.*

d. Preservation.

1. Fresh egg.

- a. Rough, dull shell.
- b. Clear when held to light.
- c. Sink in water.

2. Causes of spoiling.

- a. Bacteria entering through pores of cell.
- b. Development of nucleus.

3. Methods of prevention.

- a. Exclusion of bacteria by coating shell.
- b. Providing temperature unfavorable to growth of bacteria or nucleus.

e. Cookery.

- 1. Requires low temperature for proper coagulation of albumen.
- 2. High temperature toughens albumen and makes it difficult to digest.

f. Value as food.

- 1. Rich in proteid and fat.
- 2. Very nutritious and completely absorbed.
- 3. Good substitute for meat.
- 4. Should be combined with foods rich in carbohydrates.

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EXHIBITS.

From Corn Products Refining Company, New York. Constituents of milk, in bottles; constituents of flour, in bottles. From Murdock Spice Company, Station A, Kansas City, Mo.; Walter Baker Chocolate Company, Dorchester, Mass.; Pratt Institute, New York.

EQUIPMENT DEALERS.

In many cases local dealers will be able to supply all necessary equipment, but for guidance where they are unable to do so the names of the following firms of whom materials for domestic science may be obtained are appended:

Geo. M. Clarke, Chicago. Gas fixtures. Single stoves, \$4; double stoves, \$10. Send for pamphlet of prices.

M. D. Range Company, 96-100 Lake St., Chicago. Gas fixtures and other types of stoves. These people furnish an ideal gas plate, nickel finish; swinging plate, which can be swung back, leaving desk clear.

Orr & Lockett, 71-73 Randolph St., Chicago. Alcohol stoves, gas fixtures and all domestic science hardware equipment. These people have been making a specialty of equipping domestic science kitchens, and have lists and prices, ready for inspection, from which choice may be made.

C. G. Everson & Co., 83 E. Lake St., Chicago. Stoves, gas fixtures, and all hardware.

The Bangs Hardware Company, Chicago. Alcohol stoves, oil and gasoline stoves, gas fixtures and hardware.

For alcohol stoves:

Manning Bowman Company, Meriden, Conn. Send for booklet. Stove No. 60 costs \$4.50, and costs 0.016 per hour; another costs \$2.50.

Walker & Co., Boston, Mass. The Norma Alcohol Stove. Stove costs \$2.50; costs per hour, \$0.011.

Lewis & Conger, New York. Alcohol stove with wick. Price, \$2.70.

For all dish and enamel ware supplies, Carson Pirie, Scott & Co., Chicago, furnish beautiful varieties. Send for lists and prices.

Montgomery Ward & Co., Kansas City, Mo., furnish lists for domestic science equipment.

E. H. Sheldon & Co., 320-328 North May St., Chicago. Domestic science tables. Table for four girls, including burners for gas: Opalescent glass top, \$22.50; cement fiber top, \$19.50.

Morieta Glass Company, Indianapolis, Ind. Opalescent glass table tops.

Alberene Company, Chicago, New York and Boston. Patent stone or Alberene table top. (Looks like gray marble.) Cost, \$18.

Imperial Floor Co., 1108 Granite building, Rochester, N. Y., Cement table top.

SUGGESTIONS.

Tables may be made by local carpenter, under the direction of the domestic science teacher, and covered in various ways:

Oilcloth.—This has many disadvantages.

Soft wood.—Very hard to keep clean; unsanitary.

Zinc.—Sanitary; apt to wrinkle; discolors with water, salt and acids.

Hard wood.—(a) Oiled pine; (b) maple; (c) oak. All wood tables require much time on part of girls for scrubbing.

Glazed tile.—White. Cracks appear in cement after service.

Unglazed tile.

Opalescent glass.—Sanitary, ideal, beautiful.

Fiber cement.—Good.

Marble or Alberene.—Good.

Orr & Lockett, of Chicago, furnish a metal top which screws down on wood top; does not have the disadvantage of wrinkling found in zinc.

DOMESTIC ART.

NOTE.—The courses in domestic science and domestic art have been arranged so that both together may constitute a single unit of credit in the proportion of three-fifths and two-fifths, respectively; additional work is also described in each branch, so as to provide for a full unit of credit in each.

OBJECT OF THE COURSE.

1. To arouse in the pupil a respect for work by teaching her that manual labor, if well and thoughtfully done, is as worthy and elevating as intellectual effort.

2. To bring the pupil to realize that a woman is not well educated unless she can use the hand as well as the head.

3. To impress her with the idea that, to produce the best results in manual as well as intellectual work, thought is required.

4. To develop an appreciation of the important part that the production of textiles and clothing plays in the industrial, economic and social world.

5. To teach economy and suitability in the purchase and making of clothing.

6. To give the pupil an understanding of the principles of hand and machine sewing, with practice to enable her to make and keep in repair her own clothing.

TIME.

Amount necessary to make two-fifths unit credit. Minimum time per period, 40 minutes.

For the following outline it will be more satisfactory to divide the time per week thus: Laboratory work, one double period; theory, one single period.

PREVIOUS TRAINING.

The pupils have had no previous school training in domestic art.

EQUIPMENT.

1. LEAST POSSIBLE FOR A CLASS OF 20.

For the hand work alone the regular school desks could be used, but for the cutting and making of garments tables would be necessary:

Five tables, 5 or 6 ft. by 30 to 36 in., \$8 to \$10.

Twenty chairs, per dozen, \$12 to \$22.

Four sewing machines, \$85.

Iron; common flat iron, electric or gas, 50 cents to \$4.25.

Ironing board, \$1.

Drafting paper, per roll, \$4 to \$5.

Twenty yardsticks.

Closet or cupboard for storing materials and implements.

Materials for models furnished by the school so as to be uniform.

The pupil should furnish a box containing pins, needles, scissors, thread, tape measure, thimble, pincushion and emery; cost, 25 cents to \$1, according to what she may have at home.

Materials for articles and garments are furnished by the pupil.

2. ADDITIONAL DESIRABLE EQUIPMENT.

Locker, \$40.

Ironing table, \$3.50.

Exhibit case.

Squares, \$11 per dozen.

Skirt marker, \$15.

Mirror, \$2 to \$25.

Cutting table.

Tracing boards.

Demonstration frame.

Illustrative material—gradual accumulation.

Course of Study in Sewing.

Two-fifths unit.

1. LABORATORY WORK.

a. *Hand sewing.*

Stitches—basting, running, backstitching, overcasting, hemming, overhanding.

Seams—French, felled, hemmed, overhand.

Hems—plain, French, flannel, faced, extension.

Repairing.

By patching—hemmed patch, overhand patch, darned patch.

By darning—on linen, cotton, wool; stocking darn.

Fastenings—buttonholes, buttons, hooks and eyes, blind loops, eyelets, tape.

Simple embroidery—chain stitch, feather stitch, catch stitch, blanket stitch, hem stitch, satin stitch, outline stitch (if time allows).

The foregoing is to be worked out with as few models as possible, most of the sewing being done upon articles for household use and upon garments, such as a towel or pillowcase, bags of various kinds, a fancy or a cooking apron, curtains, cushion covers and Christmas gifts, or upon the corset cover.

b. *Hand and machine sewing.*

Corset cover.

Use tissue pattern.

Long seams sewed on machine.

Finished by hand.

Petticoat.

Draft pattern with simple, straight rule draft.

Machine work entirely with the exception of basting and gathering.

2. THEORY.

Study of textiles, materials and implements used.

Cotton, flax.

Thread, needles, pins, thimble, emery, scissors, buttons, hooks and eyes, machines.

2. THEORY.—*continued.*

Evolution of spinning and weaving.

Discussion of underwear.

Materials—width, price, durability, suitability.

Methods of making.

Estimation of cost.

Hygiene, relating especially to underwear.

Good taste.

Making a book illustrating cotton materials, trimmings, and methods of making, also the division of the whole amount spent for clothing, especially the amount for underwear in relation to outer garments.

Relative value of ready-made and home-made clothing; cost, durability, conditions under which it is made.

Laundrying of cotton and linen.

Inventors of machinery used in textile industries; ex., Eli Whitney.

Visits to mills and manufactories if possible.

Color in relation to dress.

ADDITIONAL WORK.

Three-fifths unit. Given to make domestic art one full unit.

TIME.

Laboratory: Three double periods, or two more than for two-fifths unit.

Theory: Two single periods, or one more than for two-fifths unit.

1. LABORATORY.

Drawers.

Draft pattern with straight rule draft.

Machine work.

Plain tailored shirt-waist suit.

Draft pattern with straight rule draft.

Fancy lingerie waist.

Tissue-paper pattern.

2. THEORY.

Study of wool and silk fibers.

Use of tissue patterns.

Color and design in relation to dress.

Color combinations for cotton, wool, and silk materials.

Designs suitable for various figures and various materials, emphasizing simplicity and individuality.

Extend book suggested in previous outline to include illustrations of wool and silk materials, and total expenditure for clothing.

A FEW LESSONS IN DETAIL.

TO ILLUSTRATE SUBJECT MATTER AND METHOD.

1. LABORATORY WORK.

a. *In hand sewing.*

MODEL VI.—MATCHING STRIPES AND PATCHING.

Material.

Gingham, 6 inches by 7 inches.

Two patches, 2½ inches square.

Thread, No. 70.

Needle, No. 9.

I.—Matching stripes.

A bias cut is a cut through both warp and woof threads. A true bias is made by laying a warp thread on a woof thread and cutting on the fold.

1. LABORATORY WORK.—*continued.*a. *In hand sewing.*

Model: Measure 2 inches from one corner, fold the cloth on the true bias, and cut. Make $\frac{1}{4}$ -inch turning on the bias edges and overhand them together, matching the stripes carefully. Overcast the raw edges.

II.—Patching.

A patch is a piece of cloth sewed to a garment to repair it. It may be put on in various ways, as by overhanding, hemming, and darning. A patch should be large enough to cover all worn places.

Care must be taken to have the warp and woof threads of the patch run the same way as the warp and woof threads of the garment. Stripes, checks and plaids should always match.

In patching a lined garment the patch may be overhanded to the right side.

When patching near a seam or band, it is better to rip seam or band so that the patch may be sewed in with these.

Model: In two opposite corners, measure $1\frac{1}{2}$ inch, and from this point mark off a 1-inch square. Beginning at the center cut to each corner of the square and fold back on the lines marked.

1. Hemmed patch.

The hemmed patch is best for worn material.

Hem the garment to the patch on the right side, and on the wrong side hem the patch to the garment, lapping $\frac{1}{4}$ inch.

2. Overhanded patch.

The overhanded patch does not overlap the material, and for this reason the strain comes on one thread on each side. It is, therefore, not as strong a patch as the hemmed patch.

Place the patch to the wrong side of the garment, overhand it to one end of the opening, and then overhand the sides and the second end. Overcast the raw edges.

b. *In machine sewing.*

Petticoat.

1. Materials.

2. Measures for pattern.

3. Draft pattern.

4. Making.

a. Placing pattern and cutting.

b. Basting seams.

c. Fitting.

d. Sewing seams.

French or felled.

e. Placket.

Make a model showing plackets before putting into the garment.

f. Placing band.

g. Finishing bottom.

Mark for length.

Dust-ruffle and flounce. First make model showing dust-ruffle, flounce and tucks.

h. Button and buttonhole.

2. RECITATION WORK.

a. Cotton.

History.
 Countries producing it.
 Kinds.
 Structure—plant, fiber.
 Properties.
 By-products.
 Culture.
 Enemies.
 Manufacture—from field to cloth.
 Kinds of cloth.

b. Evolution of weaving.

Need of woven material.
 Primitive looms—parts and uses.
 Later looms.
 Preparations for weaving.
 Fibers in use.

These lessons as shown require several class periods. For example, the outline for petticoat may cover one-third of a year, while the study of cotton may occupy five or six class periods.

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EXHIBIT WORK.

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 Wm. Crowley & Son, 211 Jackson Boulevard, Chicago. Needle manufacturing exhibit.
 Chattanooga Knitting Mills, Chattanooga, Tenn., for cards illustrating cotton manufacturing processes.
 Belding Sewing Book. 5 cents. Published by Belding Silk Manufacturing Company, 1121 Wabash Street, St. Louis, Mo.
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WOODWORKING.

OBJECT.

The aim of the work in manual training as it is taught in the schools of our country ranges all the way from the general development of the child's faculties and powers to the training of boys to become skilled workmen. The mechanic of the future must be an all-around workman; that is, he must understand something of both hand work and machine work, and will, therefore, be broader minded and better developed than either the old-time hand worker or the machine worker of later time, who is an expert in the handling of one particular machine, but who can do nothing else. The manual training in the schools all over the country has brought this about to a considerable extent. It has aimed to give the pupil a broader knowledge of materials, a wider range of expression, and a more extensive knowledge of tools and machinery.

It is, in fact, a systematic training, which must develop the physical, mental and moral sides of the child, if persisted in by him and if taught by the right kind of an instructor. The united action of mind and hand secures coordination of mental and motor activities, and by continued reaction insures the harmonious development of both mind and body. It gives the pupil greater control of his physical powers and increases his ability to do his will by teaching him to know his possibilities and his limitations.

The pupil who needs manual training most is he who is awkward in the handling of himself and his faculties—the boy who puts his hands into his pockets because he does not know what to do with them; whose school work is untidy and devoid of all system; who has formed objectionable habits that can be corrected under the direction of a careful, thoughtful teacher. Many things may be said to an individual which can not be said before the class, and for that reason the manual-training teacher often has a better opportunity than the teacher of academic subjects to correct the faults of the pupil.

A boy with a few inexpensive tools can be of a great deal of assistance to his parents in making repairs about the home—repairs that would mean the saving of quite a sum of money in many cases. He would, moreover, be furnished with an occupation that would keep him at home, and, because of his greater knowledge of the value of materials, would tend to make him more considerate of the property of others.

COURSE.

To accomplish these purposes the work suggested for one year in the high school may be outlined as follows:

A detailed series of graded lessons is selected by the teacher from the outlines given below. Each exercise is first presented in the form of a working drawing made by the pupil, a blueprint or a blackboard sketch. The mechanical processes of construction are then explained by the teacher or illustrated before the class, as the case demands. Careful instruction in the care and grinding of each tool should precede its use

by the pupil. A certain amount of preliminary work is necessary to rapid advancement.

This preliminary work is given below in the form of tool processes. These processes should be demonstrated to the pupils before they are employed in the making of an exercise requiring their use. Exercise in these processes may be had on waste pieces of wood, or may be applied in the making of small articles as suggested.

1. Measuring and lining exercise.
 - a. On a rough board with a two-foot rule and pencil; try-square and pencil; bevel and pencil.
 - b. On a smooth board with marking gauge; try-square and knife; bevel and knife.
 - c. On a smooth board with compass, straightedge and knife, making a protractor with 15-degree divisions.
2. Sawing exercises, preparation of stock for models.
 - a. Rip and crosscut sawing to pencil lines, rough board resting horizontally on trestles.
 - b. Rip sawing to gauge lines, piece held upright in vise.
 - c. Use of back saw; square ends, sides of grooves; the piece resting on bench hook or in vise.
 - d. Sawing on diagonal; sawing kerfs in miter box.
 - c. Curve sawing with hand-turning saw.
3. Sharpening exercises.
 - a. Straight and curved edge tools on grindstone.
 - b. Whetting straight and curved edge tools on flat oilstones and slips.
4. Planing exercises.
 - a. Making plane surfaces, jointing edges, planing to gauge lines.
 - b. Use of block plane; squaring ends held in vise.
 - c. Oblique end planing.
 - d. Rabbeting, beading, grooving, etc.
Applications: sandpaper block, picture frame, drawing board.
 - e. Router plane: planing surfaces below general surface of pieces.
Applications: bottoms of dados, or grooves, dovetail joints, etc.
5. Nailing exercises.
 - a. Nailing square joints, using brads, finishing nails and wire nails.
 - b. Toenailing.
 - c. Nailing miter joints.
Application: nail box, screw box for shop equipment, picture frame, etc.
6. Boring exercises.
 - a. Perpendicular boring with auger bits, across the grain, entirely through.
 - b. Perpendicular boring to a given depth both across the grain and in the direction of the grain.
 - c. Boring with awls, drills, countersinks.
Application: boring out unused sections, boring for admission of turning saw, boring for ornament, boring for dowel pins in joining two pieces, boring for dowel pins for fastening rails of tables and chairs to legs, drilling and countersinking for screws, drilling with awl for brads.
7. Chiseling exercises.
 - a. Sides and bottoms of grooves across and in the direction of the grain.
 - b. Sides and bottoms of oblique grooves.
 - c. Curved surfaces.
Application: gauge, mortise and tenon, dovetail, oilstone, box, rabbeting, drawing board, etc.

8. Gluing exercises.
 - a. Rubbed joints.
 - b. Clamped joints.
 - c. Doweled joints.

Application: picture frame, T square, drawing board, joints used in making furniture.

Brief talks on the following subjects should be given as the mastery of the tools and processes proceeds: Structure of wood, composition of wood, age of trees, decay of trees, season for cutting trees, lumbering and milling, warping properties of wood, measure and value of wood, preservation of wood, kinds and qualities of wood, woodworking trades. Information on above subjects may be found in *Elementary Wood Work*, by Edwin Foster, published by Ginn & Co.

In the following exercises the wood best suited is named, but other material may be used if desired or if more convenient.

1. Sawing exercise.

Stock: Pine, white. Dimensions: $\frac{7}{8}$ in. by 2 in. by 12 in.

Tools: Rip saw, crosscut saw, back saw, try-square, gauge, marking knife, dividers, T bevel, and chisel.

Purpose of exercise: To familiarize pupil with the use of crosscut, rip, and back saw; to teach pupil to make measurements with rule, try-square and gauge, and to trisect by using dividers; to teach pupil to saw accurately to a knife line across the grain and diagonally with a back saw; and to cut to an open mortise with saw and chisel.

2. Sandpaper block.

Stock: Poplar. Dimensions: $\frac{7}{8}$ in. by 3 in. by 5 in.

Tools: Rip saw, crosscut saw, back saw, try-square, jack plane, gauge.

Purpose: To teach the pupil to square up stock with the planes by planing smooth, flat surfaces and edges at right angles to each other; to saw ends of block square to a knife line; and, lastly, to round edges of one face of block $\frac{1}{8}$ in. with plane.

3. Picture frame.

Stock: Oak.

Dimensions: $\frac{7}{8}$ -in. stock, average width 2 in.; size, 8 in. by 10 in., inside measurement.

Tools: Saw, gauge, jack plane, chisel, rabbet plane, miter saw, and brace and bit for dowseling.

Purpose: Pupils are encouraged to make a good picture frame and to take it home to be of use. The exercise calls for squaring of stock, cutting a $\frac{3}{8}$ -in. rabbet with chisel and rabbet plane, and sawing 45-degree miters for joining at corners. Corners are fastened with $\frac{3}{8}$ -in. dowel pins 1 inch long, or are nailed together. Surfaces are finished with smoothing plane and steel scraper, and a coat of stain or varnish is applied.

4. Drawing board.

Stock: White pine.

Dimensions: $\frac{1}{2}$ in. by 16 in. by 21 in.

Tools: Jack plane, jointer plane, saws, rabbet plane, chisel, marking knife, gauge, smoothing plane.

Purpose: An exercise in gluing stock. For a width of 16 inches an average of three boards is used. The edges of the boards are jointed, glue is applied, and the boards are clamped together. A $\frac{1}{2}$ -in. rabbet is cut at each end, leaving a tongue to fit into a corresponding groove in a $\frac{7}{8}$ in. by $1\frac{3}{4}$ in. by 16 in. piece of pine for binding each end. This is an exercise

4. Drawing board.—*continued.*
 Purpose: An exercise in gluing stock.
 in tongue-and-groove joint fastened together with glue.
 No nails or screws are used in this exercise. The exercise
 is valuable to show the use of large and small clamps in
 gluing stock. The board is finished square and smooth and
 treated with a coat of varnish.
5. T square.
 Stock—Walnut and maple.
 Dimensions: Head, 12 in. by $2\frac{1}{4}$ in. by $\frac{3}{8}$ in.; blade, $23\frac{1}{2}$ in. by
 $1\frac{7}{8}$ in. by $\frac{1}{8}$ in.
 Tools: Smoothing plane, jack plane, jointer plane, rabbet plane,
 gauge, hand-turning saw, brace and bit, screw driver.
 Purpose: A companion piece for No. 4, furnishing a set for me-
 chanical drawing and designed to be of practical use to the
 pupil. Walnut blade is planed to $1\frac{5}{8}$ in. To each edge a
 thin ($\frac{1}{8}$ in.) strip of maple is glued. The head is cut on
 curved lines with hand-turning saw. Blade is fastened at
 right angles to head with glue and screws.
6. Tool case.
 Stock: White pine or poplar.
 Dimensions: Length 24 in., width 12 in., height 6 in.
 Tools: Saw, planes, rabbet plane, chisel, gauge.
 Purpose of exercise: A practical exercise in the making of rab-
 beted and dovetailed joints, and in the fitting of hinges.
 End pieces are fitted to sides by means of dovetail joints,
 and top and bottom are fitted into rabbets made in sides and
 ends. The box may be fastened together and sawed into
 two sections, or may be made in two sections, each three
 inches high, and fastened together with hinges.
7. Marking gauge.
 Material: Maple.
 Mortising exercise in hard wood, laying out mortise, chiseling and
 fitting, making wedge and marking point.
8. Tabet.
 Material: Oak.
 Applying knowledge obtained from previous exercises. Planing
 legs square, laying out and cutting cross pieces, half lap
 joint, joining pieces for top, laying out and cutting top to
 size and shape, chiseling mortises and sawing tenons to fit,
 drilling holes and making dowels, fitting parts together,
 gluing, use of hot and cold glue, finishing, planing, scraping,
 sandpapering, staining, and polishing.
9. Table.
 Material: Oak.
 Dowel and glueblock construction, legs joined to rails by means of
 dowel pins and stiffened with glued blocks; drawer construc-
 tion, rabbet and blind dovetail joints, finishing.
10. Table.
 Material: Oak or maple, stained.
 Laying out and cutting duplicate parts, legs tapered with saw and
 plane, and fastened to top and shelf with dowel pins; drawer
 construction, finishing with stain and varnish.

If time permits any of the following may be chosen by the pupil and made from his own designs and drawings: foot stool, lamp and shade, chair, shoe box, skirt box, fireless cooker, screen, porch swing, plate rack, book rack, music cabinet, or other articles requiring an equal amount of work may be chosen.

EQUIPMENT.

The equipment consists of the following:

For each pupil: Bench, with front and end vise, jack plane, block plane, two-fold rule (2 ft.), try-square, back saw, bench hook, spokeshave,loyd knife, marking gauge, chisels (1", $\frac{1}{2}$ ", $\frac{1}{4}$ "), mallet, whisk broom.

For general use: Rip saws, crosscut saws, hammers, jointer plane, router plane, rabbet plane, screw drivers, bit braces, auger bits ($\frac{3}{16}$ to $\frac{15}{16}$), expansive bit ($\frac{7}{8}$ to 3), dividers, awls, countersinks, scraper, turning saws, nail sets, framing square, grindstone, oilstones, screw clamps, gouges, carving tools, carving punches, hand drill, band saw, lathe.

The woodworking benches should have a straight heavy top at least two feet wide and about five feet long. These benches and the tools with which to equip them can be bought from the following: E. H. Sheldon & Co., Chicago; Orr & Lockett, Chicago; Thompson Hardware Company, Topeka, Kan.; Kitchell & Marburg, Topeka, Kan.; Bruner Hardware Company, Kansas City, Mo.; and from other manufacturers and dealers.

A very serviceable bench could be made of hard pine, oak or maple or other suitable material. The framework forming the legs and rails could be made of 2 x 4 in. material, fastened together with bolts, and the top made of two pieces of $1\frac{1}{2}$ x 2 in. material, fastened to the legs with large flat-head screws or with lag screws.

Benches with tools can be bought for about twenty-five dollars.

UNIFORMS.

Students taking work in manual training should provide themselves with aprons or overalls and jumpers for the protection of their clothing. In case aprons are chosen as a uniform they should be made long enough to be of benefit in protecting the clothing and yet not so long as to interfere with the freedom of the student's actions. Aprons made of white canvas or ticking are serviceable and easily kept clean; they have the advantage over overalls and jumpers of being cooler and more comfortable. It is best to suggest only one of the two clothing protectors named, also to specify the color wanted, so that the uniform will be standard.

TOOLS BY PUPILS.

In some communities people are becoming so interested in manual training that they are buying the tools for the pupils. This is done by subscription or by patronizing entertainments furnished by the students. The proceeds of a few entertainments would go a long way towards equipping a manual-training room.

BOOKS.

The following books are suggested for supplementary reading and to give an acquaintance with the literature of manual training:

Sloyd for Upper Grammar Grades, Larsson; Manual Arts Press, Peoria, Ill.

The Manual Training School, Woodward; D. C. Heath & Co., Boston. Mind and Hand, Ham; American Book Co., Chicago.

Bench Work in Wood, Goss; Ginn & Co., Chicago.

Exercises in Woodwork, Sickels; American Book Company.

Arts Crafts for Beginners, Sanford; Century Publishing Company.

School Arts Book; School Arts Publishing Company.

Problems in Woodworking, Murray; Manual Arts Press, Peoria.

A Short Course in Woodworking, Chas. G. Wheeler; Knickerbocker Press, New York.

Handwork in Wood, Wm. Noyes; Notes on Mechanical Drawing, Mathewson; Problems in Furniture Making, Crawshaw, and Manual Training Magazine—all by Manual Arts Press.

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FORGING.

Forge practice is the manipulation of iron and steel while in a more or less plastic form, obtained by heating the metal to a high degree of heat. It differs greatly from the more elementary forms of manual training in the kind of material used, the tools used, and in the method of work with the materials.

Forge practice is one of the best kinds of manual training to stimulate and quicken the mind of the student. After the piece of iron or steel has been heated it is formed into shape with a hammer and anvil, and the pupil must work fast and think faster, or the iron becomes cold and must be reheated. In welding two pieces of iron or steel together, the work must be done quickly, not excitedly and noisily, but with steady quickness combined with thought, for the two pieces of white-hot material will be fastened together properly only when the work is done quickly and accurately.

Forge practice is of special value to students who contemplate studying engineering in more advanced schools. It gives them the elementary practice in the use of the tools and enables them to do the elementary work before entering college, thus leaving them more time for advanced work. In many of the technical schools credit is given for the work done in the high schools, if it is well done.

Forge practice also has its value in a commercial way. Even the small amount of work that can be done in the high schools is of value in helping the student to take up the work in forging as applied to the iron-working trades, some of the more common of which are horseshoeing, wagon making, machine trades, tool making, farming, etc.

Skill of this kind would be very useful to the farmer, who with a few tools might save many a machine and much valuable time if only he understood the repairing of machinery, which ordinarily requires the work of a blacksmith.

The equipment for forge shop can be bought from the Buffalo Forge Company, Buffalo, N. Y.; Orr & Lockett Hardware Company, Chicago; Brunner Hardware Company, Kansas City, Mo.; Thompson Hardware Company, Topeka, Kan. The price for each forge and equipment will range from \$15 to \$75, excluding general equipment, as heading tools, set hammers, flatters, top and bottom swages, top and bottom fullers, hot and cold cutters.

The important principles of forge practice may be illustrated by a sequence of tool operations, which are applied to practical problems after the student has learned them. The following is an outline of such a course.

1. The forge fire.
 - a. Parts of the forge.
 - b. Selection of coal and the making of coke.
 - c. Building and caring for the fire.
2. Position of pupil at the anvil.
 - a. Use of hammer and tongs.
 - b. The anvil tools and their use.
3. Position of student helper at the anvil.
 - a. Use of sledges.
 - b. Use of general forming, punching, and cutting tools.
4. Drawing out and upsetting exercises.
 - a. The application of the exercise.
5. Pointed eye.
 - a. The eye to be 1 inch inside diameter and the pointed part $1\frac{1}{2}$ inches long.
 - b. Figure stock needed.
6. Gate hook.
 - a. Application of No. 5 and twisting of main part of hook.

7. Bolts (square and hexagonal head).
 - a. Application of upsetting exercise and use of heading tools.
 8. Welded ring.
 - a. Upsetting and scarfing ends of flat stock, bending and welding.
 9. Weldless ring.
 - a. Punching and splitting flat stock.
 - b. Opening and forming ring.
 10. Lap weld.
 - a. Scarfing and welding bars together.
 11. Forged corner.
 - a. Making sharp corners on the outside of brackets.
 12. Right-angle weld.
 - a. Used in making corner braces, etc.
 13. T weld.
 - a. Used in making braces.
 14. Ring and eyebolt.
 - a. Forming and welding round stock.
 15. Chain.
 - a. Forming and welding together three links of chain.
 16. Chain hook.
 - a. Punching, forming, and bending.
 17. Tongs.
 - a. Drawing, forming, punching, and riveting.
 - b. Welding.
 18. Clevis.
 - a. Upsetting middle and ends, forming ends and punching holes, bending to shape.
 19. Whiffletree irons.
 - a. Bending, welding, and pointing.
 20. Working of tool steel in making simple tools as follows:
 - a. Heating the piece.
 - b. Working to shape.
 - c. Hardening and tempering for different uses: cold chisels, center punches, stone chisels, iron drills, stone drills, hammers.
- If time permits the pupil may make forgings from his own designs and drawings of such pieces as foot scrapers, andirons, pokers, fire tongs, etc.
- The pupil should be encouraged to bring in pieces that need repairs.

EQUIPMENT.

For general use: forges, hand or power; sledges, 5 pounds and 10 pounds; fullers, $\frac{1}{4}$ inch to 1 inch; swages, $\frac{1}{4}$ inch to 1 inch; anvils; heading tools; hot and cold cutters; emery grinder.

For each pupil: hammer, $1\frac{1}{2}$ pounds, ball pene; one pair bolt tongs; one pair chain tongs; one pair straight tongs; hardy; punch.

The following books are suggested for reference: *Forge Practice*, by J. L. Bacon, published by John Wiley & Sons, New York; *Farm Blacksmithing*, by J. M. Drew, published by Webb Publishing Company, St. Paul, Minn.; and *Notes for Forge Shop Practice*, by Littlefield, published by Manual Arts Press.

COMMERCIAL BRANCHES.

ELEMENTARY BOOKKEEPING AND BUSINESS PRACTICE.

Reference books for teachers: Bentley's Science of Accounts; Cole's Accounts, Their Construction and Interpretation; Hatfield's Modern Accounting; Sprague's Philosophy of Accounts.

Books for supplementary exercises: Bogle's Comprehensive Bookkeeping; Marshall's Double Entry Drills; Ellis' Practical Bookkeeping; Moore and Miner's Series.

Almost any textbook is useful for this purpose.

Elementary bookkeeping should (1) give a thorough knowledge of fundamental principles; (2) lay the foundation for the study of advanced bookkeeping; (3) make the student competent to act as assistant bookkeeper, or to take charge of a simple set of books.

The state textbook must, in a measure, determine the method and order of teaching the subject. Not less than a full year should be taken if the student desires to obtain such knowledge of the subject as will enable him to do practical work. With the proper amount of supplementary work the state text will answer for a year of high-school study. The course may be divided into two parts: Theoretical bookkeeping and business practice.

I. THEORETICAL BOOKKEEPING.

1. Nature of a business transaction. Principles of debit and credit, illustrated by the use of numerous simple exercises.

2. Form and use of the journal daybook; several simple sets to be written on loose journal paper before taking up the matter of posting. Keep the exercises, to be posted later.

3. Use of the ledger; many simple accounts written on loose ledger paper. Posting; use the journal exercises that have already been written by the students.

Numerous supplementary exercises should be given to be written up in journal daybook and posted in ledger. Statements should be made and ledger closed.

It is especially important that numerous drills in closing the ledger be given and the student instructed in the relation of the accounts to each other.

It is recommended that the work above outlined be given in connection with the work in the textbook up to page 22, and that then the transactions given in the textbook for February and March be written in the blank books, with frequent supplementary oral class drills in connection therewith. At the conclusion of the March transactions in the text, give not only the two "test ledgers" there mentioned, but also much additional drill, so that the student may be able to close a ledger with absolute accuracy and to make the business and financial statements.

II. BUSINESS PRACTICE.

The definition and use of each form of business paper should be carefully explained. The instructions in the textbook are quite specific, but additional instruction by the teacher is very necessary, and supplementary exercises for drill, test and information of students should be frequent.

A bank and a general office or exchange will contribute much to the interest and profit of the business practice as given in the text.

SUGGESTIONS.

1. Aim to secure independent thinking. Develop reasons for each step taken. Bookkeeping, if properly taught, is a disciplinary subject of high value.

2. Give frequent oral drill.

3. Insist on accuracy and neatness.

4. Give many short reviews.

5. Use problems requiring students to make business and financial statements from footings taken from ledger, cash book, sales book, invoice book and inventories.

ADVANCED BOOKKEEPING.

Second Year.

It is not possible for the students to become familiar with all the books used in all lines of business, but the more common kinds may be studied. The students should be made familiar with special-column books, auxiliary ledgers, loose-leaf and card systems, duplicate billing, etc. The work of this year should include wholesale and retail grocery business; changing from single to double entry; commission and shipping business; banking and manufacturing sets.

COMMERCIAL LAW.

This course should give the student such a knowledge of business law as will enable him to keep out of litigation; to understand his legal rights and limitations in ordinary business transactions, and to know when he needs the services of a lawyer. It should also teach him how to use the supreme court decisions and the statutes of his state.

Special attention should be given to the law of contracts as it is the basis of all business law. The statute of frauds, which prescribes what contracts must be in writing, and the statutes of limitation, showing the time in which suits may be brought to enforce certain obligations, should receive careful attention.

Common legal forms should be studied and written by the student, such as ordinary contracts, deeds, mortgages, articles of copartnership, bills of sale, leases, etc.

A good textbook should be the basis of the course.

STENOGRAPHY.

The course of study, in order to make the student a practical stenographer, should cover two years. In that time he should become able to write ordinary business and literary matter at the rate of 100 to 125 words per minute.

The first year should give the student a thorough mastery of the principles of the system used and enable him to write accurately new matter of ordinary difficulty at the rate of fifty to sixty words per minute, and to transcribe his notes readily with pen or typewriter. In this year emphasize the mastery of principles.

Emphasize thoroughness, neatness, proper position at desk, correct method of holding pen or pencil, good penmanship and shorthand characters.

Use simple dictation exercises as early as possible. Have short reviews, require neatness, accuracy, promptness, and train to fluency in reading notes.

Tests should be given at the end of the course, in which the student should write accurately 500 to 600 words of new matter in ten minutes, and read back immediately without mistake or hesitation, and transcribe his notes readily as stated above.

Second Year.

The second year of shorthand will be devoted largely to the study of phrasing, word signs and advanced shortening principles, and to speed practice. If the school does not possess a dictograph, it is advisable to arrange for students to dictate to each other as a preparation for class recitation. A speed of 100 to 125 words should be attained and notes should be read and transcribed accurately and readily.

The suggestions given for the first year apply to the second year's work as well.

TYPEWRITING.

In most high schools but one period a day can be given to typewriting practice, owing to an insufficient number of machines.

The student giving one period a day for one year to typewriting practice should be able to write accurately, by touch, ordinary business or literary matter at the rate of twenty or twenty-five words a minute, and should also acquire a good knowledge of (1) the mechanism of the machine; (2) how to care for the machine; (3) forms of letters; (4) addressing envelopes; (5) carbon work.

Second Year.

The second year of typewriting, the student giving one period a day to practice, should enable him to write accurately new matter at the rate of forty to fifty words a minute for a period of ten minutes or more.

The student should also take advanced work in tabulating, invoicing, stencil work, carbon work, and other matters pertaining to up-to-date office practice.

PENMANSHIP.

Good business writing is in demand. Business men give preference to applicants who can write well. A poor writer stands a small chance of obtaining a good position in a business house.

OUTLINE OF COURSE.

1. Materials.
2. Position: (a) Body, (b) arms, (c) feet, (d) hands, (e) pen, (f) paper.
3. Muscular-movement drill.
4. Letters and figures.
5. Words and sentences.
6. Page writing and business letters and forms.

SUGGESTIONS.

1. Use good materials.
2. Be particular in requiring correct position.
3. Drill, drill, drill in muscular movement.
4. Use the blackboard.
5. Show the pupil by example.
6. Use the best specimens to stimulate the class.
7. Discourage flourishing and shading.
8. Encourage use of muscular movement in all pen work of the commercial course.
9. The real test of penmanship skill is the ability to write well when the mind is absorbed in what is being written. Toward this end all instruction and drill should be directed.

COMMERCIAL ARITHMETIC.

This course should give the student a practical working knowledge of the common operations and problems that are met with in business life. Absolute accuracy should be insisted upon, and methods used that are approved by the best business usage.

Special attention should be given to fractions, denominate numbers and percentage, with emphasis upon problems that are practical.

Rapid drill work and practical short methods should receive attention. Give special drill upon problems arising in the community.

SUGGESTIONS.

1. Drill in horizontal addition and subtraction.
2. Train in rapidity but emphasize accuracy.
3. Have pupils bring in practical problems.
4. Make up original problems.

COMMERCIAL GEOGRAPHY.

- I. Growth of commerce, from time of barter through Mediterranean period to sixteenth century.
- II. Study of the important nations of the world.
 1. Physical factors influencing climate. Climatic influence on agriculture. Trade routes controlled by relief.
 2. Resources.
 - a. Soil, agriculture, forests.
 - b. Mineral, chiefly coal, iron and petroleum.
 - c. Water, power, navigation, fish.
Location of each, value, development, relation to industries and trade.
 3. Industries: Iron, textile, and agricultural. Factors influencing location and development. Centers and markets.
 4. Transportation.
 - a. Modes of travel and their development.
 - b. Trade routes and trade centers.
 - c. Waterways *vs.* railroads.
 - d. Requirements for a good harbor.
 5. Trade.
 - a. Character of exports and imports.
 - b. Manufacturing *vs.* food stuffs and raw materials.
 - c. Trade centers and markets.
 - d. Relation to colonies.
 6. Generalizations from study of nations.
 - a. Relations of coasts to man in a commercial way: (1) Types of harbors and examples. (2) Value of good harbors to a nation.
 - b. Relation of land forms to trade routes, to navigation, to building of railroads, to waterpower for manufacturing, to industries.
 - c. Natural conditions that affect commerce: Climate, soils, ocean currents, winds.
 - d. Influences that determine the position and development of cities and harbors.
 - e. Characteristics of peoples in relation to development of resources and industries.
- III. World's commercial commodities.
 1. Products of the soil.
 - a. Origin and characteristics of plant.
 - b. Climate and soil required.
 - c. Problems of production, harvesting, marketing, import, and export.
 - d. Future supply.

By graphs show world's production areas; production and export through a series of years; rank of nations in production and consumption.

Examples for study: Wheat, maize, oats, rye, barley, rice, fruits, garden products, tea, coffee, cocoa, oils, tobacco, rubber, gutta percha, cotton, flax, vegetable fibers, silk.

2. Animal industries.
 - a. Physical characteristics of producing areas.
 - b. Rank of nations.
 - c. Industrial centers.
Examples for study: Sheep and goats; cattle—beef, dairy, leather; swine; fur-bearing; fish; canning.
3. Forest products.
 - a. World's forest areas.
 - b. Lumber, wood pulp, resins, alcohol.
 - c. Present waste and problem of future supply.

III. World's commercial commodities.—*continued.*

4. Mineral products.

a. Geological and geographical distribution.

b. Mining conditions and social problems of miners.

Graphic material: World's coal and iron areas; output of coal in United States since 1850; rank of nations in coal and iron since 1870.

5. Building materials: Stone, clay, cement. Importance in modern construction.

IV. Study of local industries.

1. Influences in starting.

2. Relation to markets and transportation.

3. Development in past and future.

REFERENCES.

Chisholm, Handbook of Commercial Geography; Robinson, Commercial Geography; Gregory-Keller-Bishop, Physical and Commercial Geography; Adams, Commercial Geography; Bartholomew, Atlas of World's Commerce; Fresman and Chandler, World's Commercial Products; Mill, International Geography; Ward, Climate; Bartholomew and Lyde, A School Economic Atlas; Dondlinger, Book of Wheat; Brooks, the Study of Cotton; Myrick, The Book of Corn; Bailey, Encyclopedia of American Agriculture; Willis, Agriculture in the Tropics; Van Hise, Conservation of Natural Resources; Mineral Resources of the United States (annual); Statesmen's Year Book (for statistics); Year Book of United States, Department of Agriculture (for statistics); Census Reports of United States.

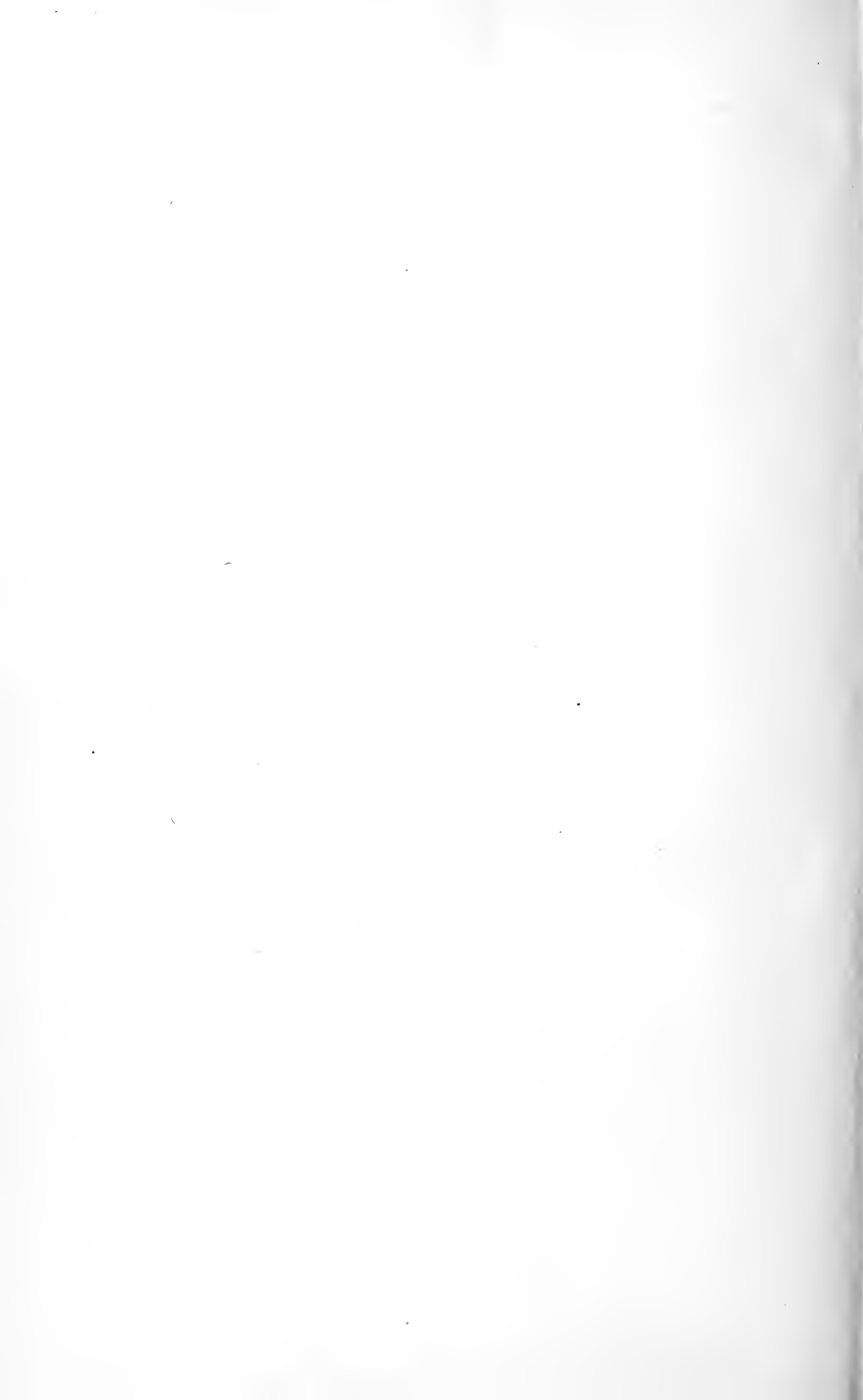
NORMAL TRAINING BRANCHES.

Detailed outlines of the distinctively normal-training subjects: Methods, management, and the reviews in arithmetic, geography, grammar and reading will be found in the Normal Training Manual issued by the State Department of Public Instruction.

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